

COMMODORE 64 MEGABASIC—SPECIAL OFFER INSIDE

# YOUR 64

JUNE 1985

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The Final Frontier?

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# Y64 MENU

## MEGAGAMES



# 24

**They're Off!** Belt up and hang on to your helmets as we take a couple of laps around CBS/Epyx's *Pitstop* it.



# 32

**The Final Frontier** In space, no-one can hear you scream! ... because they're all too busy playing Firebird Software's *Elite*!

## PROGRAMMING

# PROTECT & SURVIVE

Protecting a listing from prying eyes can often be more trouble than it's worth. But if you've got something to hide, keep it well hidden — with a little bit of crafty code to beat the cheats. Read on ...

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## READER'S OFFERS

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**20 Questions** Exam fever? No problem! Stick with us and your revision will be over in no time ...

# 49

**The Scribe — Part Two** Design your own adventures — you think up the ideas, we'll provide the programming. It's easy when you know how!

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**Y64 Adventure Helpline** You need never get stuck in an adventure program again! Think about it ...

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**Y64 Chart Challenge** If you want to become an official Y64 Games Consultant, you'll have to beat our high scores. Go on, we challenge you!



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Cover illustration by Michael Brownlee

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Y64 Helpline enquiries between 10am-1pm and 2-5pm, Tuesdays and Thursdays only!

**Year 64**, Sports Illustrated  
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Admission: Adults £2.00, Children (under 14) £1.

# OPEN ACCESS

If you want to know what Ariolasoft, Virgin Games, Rumbelows, Micro Computer International, SMC, Computer, Amrog Software and Commodore are up to... read on!



It's aboard for Microsoft's Spitfire 40 simulation. Clocks away!

## Roger 'n' Out, Biggies!

Think ah!... you're a Spitfire pilot in the

summer of 1940 and you're about to undergo flight training in Britain's most famous Spitfire plane! Welcome to Microsoft's Spitfire 40... First off, you've got to

learn how to control the Spitfire in practice mode — then, as you progress, you'll move on to practice combat and ultimately to combat level. All combat and practice experience can be saved to your flight log enabling you to rise to the coveted position of Group Captain, DFC, DFC, VC.

Microsoft is also running a competition in which dedicated players, who've reached the rank of Group Captain, will be included in three prize draws for a fabulous day in the Battle of Britain Museum.

Spitfire 40 comes complete with a flight manual, quick reference and keyboard guide, and is available for the 84 on both disk and cassette at £12.95 and £9.95, respectively. Potential pilots should get in touch with Penfelter at 01-442 3547.



Amrog Birmingham's Squash puts the ball in your court!

## What A Racket!

New Generation Software has just launched Jonah Birmingham's Squash for the Commodore 64. This simulation squash game was developed under the steady eye of Jonah Birmingham (former World Squash Champion) and is said to sport superb animation and 3D effects. Programmer

Malcolm Evans has also incorporated a new concept called Reproduct (Whatever that is, Ed) which Malcolm claims will make the game even more realistic.

Jonah Birmingham's Squash is priced at £29.95 on cassette, further information can be squeezed out of Paul Evans on (0432) 438434.



## Have A Ball!

Ariston A tracker ball that's claimed to actually stand up to constant use....

The Marconi RB2 tracker ball has finally been launched for the 84 and looks destined for the big time. And it's priced that way too — £59.95.

Developed for serious hobbyists, educational establishments and users of graphics packages, Marconi claims the RB2 is the most stable and accurate joystick on the market.

Dial Marconi on (0942) 44304 if you're having trouble tracking the RB2 down

## Good Connections?

Here's a few details about a parallel Centronics interface from Zero Electronics. Connected up to the 84's serial port, the Zero interface is compatible with all existing software. And the good news is that the interface can also be connected to a daisy-wheel printer or

graphics printer.

We're assured that the price has been kept down to £40.95 because of the use of a custom chip, but there's also the option of a 16K buffer that means waiting between printouts will become a thing of the past.

You need to hear more? Sam's touchline Pete Griffiths on (0455) 840935.



## Dear Diary...

The Secret Diary of Adrian Mole: 10th May 1985, pm. Nigel will be really phobic when he tells me Mosaic Publishing is soon to release a new computer game about me. The company's going to put my secret diaries on a computer. (Just hope they censor the bits about the steamy scenes I had with Pandora or she'll kick me in the gookies. She says she won't be labelled a 'scarer' woman by Blue Sunday (goodness knows who he is).)

Mother says she's glad it's a text adventure as she thinks kids these days are getting too engrossed in making the Bunkies (which I thought was really helping East-West relations).

I've been told by Mosaic's Joe Lang that the game should be out in the Autumn — but that's all they're allowed to say. I'll get too nervous. I'll be ringing Sam on 01-228 4463... how about you, dear diary?

# ARCADE ACE

Archie does things on *Ghostbusters* and *Henry's House*... with a little bit of help from his friends!

Back again with a whole bunch of tricks 'n' tips for all you joystick junkies...

And first off, we'll start with Software Projects' SIC's *Ghost For Tyne*, especially as I've got some advice from

**Stephen O'Connor** of West Lothian. He tells me that when you get to the river, the best thing to do is wait for one or two to drop in a tub for the fourth time and then go for it. He also suggests that you go to the far left of the screen before you start your journey across the turtles.

That's all well and good, Stephen, but if you jump the first three turtles when you first go to the river, wait, and then jump the last turtle, it's a lot quicker!

Moving on to *Archie's Ghostbusters*, I've had quite a few suggestions as to how to beat it. But by far the most valuable is the one from **St Thomas** of Cumbria, who's found an ingenious way of trapping the ghosts. All you have to do is manoeuvre both ghostbusters to the far left of the screen, and they're in exactly the same place, and then fire the streams and set off the trap. You'll find that no matter where the ghost is on the screen, it'll be caught.

And before we move away from *Ghostbusters*, why not try a tip from **Joseph Reed** of Swindon. Apparently if you type your name, "yes" to the account, and input "2000" as the account number, it could be useful!

Moving on to a game I've recently introduced to the moment, *English Software's Henry's House*, I've a few suggestions for those of you, like me, who've had a problem with levels three to six. I've dealt with

the screen shots given, but for levels five and six, read on!

Level five is fairly easy really — all you have to do is collect all the objects at the top and drop off the right-hand side of the screen, making sure you press the fire button when you pass the highest of the tower blocks so that you parachute to safety.

To complete level six you've first got to collect the objects on the left and go to the right to get the objects on the ladders. You've now got to grab the telephone from the

top left of the screen, and for that you'll have to use very fine control of the joystick. You'll have quite a few close calls, so make sure you have a joystick that allows you to move extremely short distances at a time.

And that's all for me this month... But remember, if you've got any tricks 'n' tactics you want to share or you can't beat a particular screen on any game, write to me, *Arcade Ace*, at Four 64, 14 Plainville Place, London W1P 1DE. Let's be hearing from you!

Remember to make sure you're in the right position to jump to the next level.

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## It's A First!

Two new companies — namely First Publishing and First Software — have been set up to put serious, high-quality business software and books within the reach of Commodore-64 owners.

The companies have published a range of seven books and five disk-based software packages including an *Appendix-Master* at £19.99 and *First WORD*

64 wordprocessor at £25.99, and all software will come with a large ring-bound master volume book.

Managing Director, Ross Galloway told us: "We aim to fill the gap between cheap software that isn't good enough and business software that's just too expensive. Sounds reasonable..."

If you want to find out if they can fulfil their claim, contact Peter Jones on 01-58019418/9.



## Software Super-Savers

The "194 super-hype" saved this month goes to *Archie's*, who's giving away £10,000 worth of goodies over the next few months. All you need to do is to get hold of any one *Archie's* title and send the enclosed coupon off to the company itself, who, however, you submit the Paul Carruth Sharpness and walk away with an £804.

Each *Archie's* title also contains a special discount voucher — and if you collect them you start saving money! Five vouchers will get you £5 off a choice of titles, three vouchers save you £10 on a *Cum* speech synthesiser, and, if you can wait long enough to get 15 vouchers, you'll save £30 on a Commodore 194 disk drive!

Contact the "company" at Archie's, Nick Thomas, on 01-222-5803, for further information.



This happy group of people are the Henry Family. And the reason they're so happy is that they've just won a fair-weather holiday in Florida and £1,000 simply because they managed to place in the correct order seven features of the C64. And why didn't Commodore and Spectrum group PUZ choose to have the competition around the C64? Well, never has it been for judges based on many fine features of the C64 that the chances were no one would have been able to get them in order! Seven features are these... but 771!

# OFF THE HOOK



If you've got a problem on the Commodore 64, don't bottle out... ring Martin McGuinness on the Y64 Helpline.

The phones haven't stopped ringing over the past month! I was kept on my toes each Y64 Helpline day — but some of you still insist on ringing on the other days as well. It's great to hear from you all and I'm happy to try and answer all of your questions, but please limit your queries to Tuesdays and Thursdays only!

And now let's get down to business. A number of callers seem to be having a frustrating time getting their games software to load. Well I'm not able to defend software manufacturers, but I doubt it's the fault of the game itself... more likely, the problem's with your diskette.

Commodore cassette decks are of very high standard, but there are a few on the market that seem to have difficulty with programs loaded at 300 baud. And, of course, now the games market is inundated with all sorts of 'go-faster' loaders between 300 and 3000 baud, the Commodore said, indeed, quite a few other tape decks are feeling the strain. The solution? Well, there isn't really one as such, but it's worth checking out Interceptor Micro's *Asimul Head Alignment package*. For your £8.99 you'll get all the gubbins you need to set your tape recorder up for perfect loading. There's even a test-game there in as a bonus.

Back to the Y64 Helpline. I had a very pesky Stephen Kewney on the line, nagging me to explain how to get through the hole in the adventure *Murder Manor*. Mr Kewney, first you've got to get hold of the candles, matches, meat and the ladder. Then type 'Go Hole' and

'Get Hole', and you're nearly there! By the way, of course I'm happy to offer advice on adventures if I've played them, that is, but you'd be best advised to write to the Y64 Adventure Helpline if you've got a major hassle on your hands. Write to the Y64 Adventure Helpline, Four 64, 14 Haddon Place, London W1P 12E... and that applies to adventures known-to-all too — why keep all those secrets to yourself, send in all your adventure hints 'n' tips now.

You've had a couple of readers on line enquiring about the Y64 Checksum program (Y64, issue 7). Well, the idea is that using the Checksum program you can make sure that any listing we publish in your 64 can be typed into your Commodore 64 without error; any error shows up each time an incident line is typed in. If you'd like a photocopy of this program or a photocopy of the Checksum data for any programs published in your 64, please send me a stamped addressed A4 envelope and I'll do the rest.

Finally Angus Muir of Cheffins rang me with some very useful tips for Y64 readers. He ticked off with the first that joystick port 1 is an address 56321 and joystick port 2 is an address 56320; he then went on to give me a couple of useful POKEs, one to disable the Run/Stop feature (POKE 808,255) and another to enable it (POKE 808,254). Cheers, Angus!

The Y64 Helpline is available on 01-426 3803 between the hours of 11am-1pm and 2-5pm on Tuesdays and Thursdays only!

## On Safari

Fancy a break? How about a trip to the jungles, especially when Elephant Memory Systems is facing the bill. Enter the Kompa Safari Competition — by purchasing a 10-pack of Elephant floppy disks — and you're in with a chance to scoop up one of four super two-person safaris, first class accommodation and all expenses paid, of course. What's more, you may even get the chance to travel on a 'jambo' jet.

Details of the scheme come with each of the special packs but, if that's not good enough, chat to John Wise on (0423) 41244.

You don't have to go to Africa to buy Elephant Memory disks... but that's where you could end up!

WIN A SAFARI TO KENYA WITH YOUR NEXT PURCHASE OF ELEPHANT DISKS.

Just complete the coupon and



# YOUR 64 ADVENTURE HELPLINE

Having problems with an adventure? Don't give it another thought!... that's what the Y64 Adventure Helpline's all about!

What we've got here is an opportunity for those of you going through that frustrating experience of getting stuck somewhere in an adventure program to share all... and tell the latest readers of Y64 contents your ad. All you have to do is write in and tell us which program you're having trouble with, and your address or phone number so that some kind soul can contact you, and we'll do the rest!

Adventure fanatics, both frustrated and knowledgeable, should complete the coupon and send it off to: Y64 Adventure Helpline, Four 64, 14 Haddon Place, London W1P 12E. Or for 01

Two Kingdom Valley Richard Harris, 1 60 Bolton Road, Huddersfield, West Yorkshire.

## ANY ANSWERS?

The Hawk Michael Stewart, 80 Stourcross Road, Loughborough, Leics. LE11 0AP. Tel. (053) 72238.

Europe Johnathon Wilson, 5 Brookside, Wallington, Surrey GU24 0AG. Tel. (0424) 271 692.

North Coast Mr R Scooter, 80 Middle Leasings, Woodgate Valley, Birmingham B32 1 9H. Tel. 021-422 8303 (after 4pm).

Drops Of Rain Mary Ann Leach, Tel. (0447) 809942 (after 4.30pm).

Upper Garsdale Matthew J Gregg, 18 Southside Road, Southside, Warrington, Merseyside WA1 1BL. Tel. 021-429 8353 (between 5 and 6pm).

# Y64 ADVENTURE HELPLINE

I'm admitting failure with/without the No. 1 scored (at) \_\_\_\_\_

Here's my problem (as/without) \_\_\_\_\_

Delete as appropriate

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Address \_\_\_\_\_

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And if/else there is/are (any/many)

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# SILVER RANGE

# Seeing



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**CRAZY CANNERS** - Not only cannery, but hungry mouths to feed.



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Both prices include postage.

Send your best screen on cassette or other state for colour, if possible, with a crossed cheque/PO made payable to FREDRIC SOFTWARE, to the address below. Your cassette or disk will be returned with order. Allow 14 days for delivery.

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FREDRIC SOFTWARE, WELLINGTON HOUSE, UPPER ST MARTIN'S LANE, LONDON WC2H 8BN

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Please note: Fredric requires indication of disk. No communications.





**Bin It!**

If you haven't already had enough of the Thames Television quiz show 3-2-1, there's now a 64 version of the game.

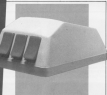
More Computer International is the company responsible and this amazing 3-2-1 available by mail order only. There's the usual display of things to be won, but there's a star prize of one week's holiday for two in sunny Spain. Other prizes include fidelity colour TV sets, Raleigh bicycles, food processors, microcassette monitors, Trojan light pens, Christmas paraphernalia and software by Virgin and New Generation.

There's also the chance to win the booty prize — yes, you've guessed it — a Bendy Toy's Dandy Bin.

For further information contact Paul Duffy on 01-894 1735.



3-2-1 gives you the chance to win a Spanish holiday, colour TV, perfumes and telephones and — would you believe — bicycles and food processors.



SMC's Mouse should make you 'figure' for thought.

**Mouse Trap?**

SMC has released the Mouse — a peripheral that'll help more than 64 users get the most out of their machine.

Priced at £59.95, the Mouse isn't cheap... but you do get a neat array of facilities thrown in,

including a choice of 18 colours, various brush shapes, air brush, fine point and many others. There's also a variable size text and graphic button for those who get into a mess.

Find out more about the Mouse from David Cornerstone on 01-892 9134.

## COMPUNET CORNER

*Make the most of the Your 64 pages on CompuNet with Surys. Read all about it!*

For the uninitiated, here's a brief run-down on how to set yourself up to gain access to CompuNet. First up, you'll have to shell out £18 for a rectangular British Telecom socket. Then you'll need to get yourself a Commodore Commodore Modem — that's available from Commodore (0536) 2602627 for £99.95, but included in that price is your first year's subscription to CompuNet.

With your 64 turned off, now insert the modem plug into the cartridge socket and plug the modem lead into the telephone socket. Now switch the 64 on and you should be greeted with a white sign-on screen.

completes with the CompuNet 1.0 message; if you get the normal blue start-up screen, switch-off and start again.

You're ready now to follow the logging-on instructions given in the CompuNet manual. Once done, press 'GO TO' from the duckfoot at the bottom of the screen and press the Return key. Now enter 'GO TO' 108377 and you'll be whisked away to the 194 pages of CompuNet.

As CompuNet news this month is a bit thin on the ground, we're going to be looking at some of the letters you've sent us on the system... and it's great to hear from you. This may not have time to answer all your letters

personally on CompuNet but, rest assured, we'll do our best to publish the best ones either here or in *Surys* — so keep 'em coming! In the meantime, if you do have an urgent technical problem, ring us on the 194 helpline on Tuesdays and Thursdays between 10am-1pm and 2-4pm on 01-894 3673. And without further delay, over to your letters.

I've been trying to get some help regarding the use of a Stencor CP80 printer and printer interface with the CompuNet system and the Commodore Modem. Where would you suggest I start looking for an expert in this area? John O'Brien (C084)

The best advice we can give you is to register Commodore Information Service at (0536) 260262 — they're really very helpful. Or, again, if some of our friendly 194 terminal jokers get onto us with an answer to you... Surys.

Can you tell me how I can go about loading data recorded on a Pison Organiser into my Commodore 64? What I'd really like to do is load the data on to a program

such as Superbase for subsequent processing and printing out. Steve (S044)

What you really need to get is a good communications program, as RISC interface and a Pison RISC2 cable. Your first step should be to buy the Pison cable and then get a respectable Commodore dealer, and get them to demonstrate the best combination to go with it, Steve.

I've just been leafing through the latest issue (194, issue 8) and seen your plea for ideas on things to do with CompuNet.

Well, I'd like to say a few things about MUD (Multi-User Dungeons) — a fully interactive adventure game. It's a great game, but in the short time I've been playing I've seen many a player accumulate expensive points only to die at the hand of a 'rogue' wizard who thinks it's fun (I'm still a lower-ranked person). Why don't CompuNet change the game rules so that once you've achieved a reasonable score, we'll let you crash your on-line when. And, yes, it's

happened to me!

Also, could you help me (and others, I'm sure) by telling me all the access numbers for the public database. David Mitchell (D0808)

Send us an SAE, David, and we'll post off a list of public terminals to you asap. Has anyone else come a cropper in MUD... let's hear from you, Steve.

Can you help me? I'm trying to find a program that will transform my 64 into a terminal. The program should allow me to change its display and sound rates on-line, as well as clear the screen when the cursor goes to the right of the screen and doesn't scroll.

I accessed the program you put up on the 194 pages on CompuNet, and it's very good. It's just that I now find I need three new facilities. Brian

Well, Brian, your best bet is to contact Data Transcom Computers on (0484) 919999 — the company specialises in communications software, and you might just find what you're looking for, Steve.







# MISSIVES

check-out data for and we'll do the rest. Of course, if you're writing to us from a copy of the *Checkmate*, why not take it to the shops at the same time? Ed.

## Time Warp

I'm the jealous partner of an American C6404 and I've now got the opportunity to buy and use some of the excellent UK software available.

The trouble is that some games, like *Counterforce* one, aren't run on my system: needless to say, the cassette loads and runs fine on a UK system.

I've been told that the problem is related to a difference in the clock speeds and can be rectified by some ROMs. I'm sure. Any ideas? Dave Martin, South Arabia.

Well, Mr Martin, there are two possible hardware systems that you could be using with your computer. Either PAL — the British system or NTSC, the American one. My PETting at location 1770s can find out what system you have. If there's a card here then you'll know your machine is American and why it won't

work when using UK software. However, try typing "P040 670.0" — this should verify the problem, if you still cannot get it to work refer to page 160 in the *Programmers Reference Guide*. This section deals with video registers — you may find register 0004 requires some changes if screen interrupts are used within the programs. Ed.

## One For The Code!

I'd just like to correct one point that the dreaded "liquid loader" owner (P-OFF last) raised (Missives, P14, issue 8). When most of the ROM is switched to RAM, the 04 is only 'useless' if the user is trying to use Basic. In machine code (if he knows what that is!) the machine functions perfectly, up to ROM of RAM! The Two—Need ROMs, Durham.

Let's hear more Mr Smith! It's not often we get readers who write in using the phrases "machine code" and "the machine functions perfectly" in the same sentence. But seriously, any hints and tips you've got, especially in machine code, send 'em in. Cheers Tony Teaf! (or any

other machine code magicians). There's a legion of 64 stars waiting your words of wisdom. Ed.

## Driven Crazy!

I recently bought a 1541 disk drive to add to my 64 and I'm becoming increasingly frustrated waiting for commercially produced games cassettes to load... while my disk drive sits there switched off!

Is there anyway I can transfer commercially produced software (including Turbo-load and machine code programs) from tape to disk — especially since I'm unable to break most of them! Can you advise please? Ross Chestney, Crawley, West Sussex.

And there's the rub, Ross. The only real and 'proper' advice we can give you is to try doing every bit of the games you want to play. Otherwise, there are ways of converting cassette based programs to disk, but this is where we enter the realm of 'hacking games'. Perhaps it's worth putting pressure on the software houses to start distributing programs

on cassette and disk. What do you think? Ed.

## Staff Problems?

I was very interested in the map of Staff Of Karnath (P14, issue 8). I've been trying to finish this game for quite a while... all I managed to pick up was eleven of the pieces.

However, that's all changed now! I've finished the Staff Of Karnath once and for all! The Mentor spell worked as you correctly forecast and the message relating the congratulations was very nice to see. And if anyone out there still hasn't completed the game yet, keep trying! Thoroughly enjoyed it.

Graham Craig, Inverness, Aberdeenshire.

Thanks, Mr Graham 'Dance Digi' Craig! Even with my map, all the pieces together couldn't finish Staff... and since your letter, the P14 editorial office is once again swamped but at least trying to finish it. (It will, since to hear we've got satisfied customers... Ed.

## FAST LOADERS Commadore TAPE TO DISK 64



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\* For 1984, a complete guide to the use of the British Telecommunications network.



## YOUR 64/VIRGIN GAMES COMPETITION

If you haven't yet seen Virgin Games' latest release, *The Gates of Dawn*, the plot involves you taking on the persona of a knight in shining armour and you have to solve the graphic adventure before the break of dawn. And if that sounds like a bit of a task, you aren't seeing anything yet...

What we've got for you here is a sort of 'top of the difference' competition... with a difference! Look carefully at the illustration and you may see one or two Virgin Games logos in amongst the design: the Virgin Games logo is a Pac-man's shape with a triangle coming in from the top. Of course, there are more than just one or two logos hidden there... but that's for you to spot.

When you think you've found all the Virgin Games logos, ring them on the illustration and complete the rest of the coupon. Then, before you pop it off into an envelope and post it off to us, write the number of logos you have on the back of the envelope. All entries should be sent off to Virgin Games.

We're not talking nightmares here... it's a dream come true! Your 64, in conjunction with Virgin Games, presents a competition that gives you the chance to win all sorts of goodies. Read on!

### SLEEPLESS NIGHTS AT THE GATES OF DAWN!

# LOGO COMPO



Logo Compo, Your 64, 14 Rafflebone Place, London W1P 1DB.

#### Prizes Galore!

Obviously we couldn't ask you

to stain the off-beat cells too much if there wasn't a decent chutney of goodies to pick up at the end of it all. For the first five correct answers out of the

Editor's voluminous list, there'll be a Virgin-Assembly Flight Bag (but that's not all... far from it!) inside each bag, you'll find a Virgin Atlantic Watch, a custom-built calculator, a Virgin games T-shirt, a Games Of Gamemaster poster, and copies of the classic games *Nelson*, *Pac-Man*, *Serious* and *Terrorist*. Not bad eh?

And that's not all! The next 20 correct answers pulled out of the hat will each get the Games Of Dawn video player, a Virgin Games T-shirt, and copies of *Pac-Man*, *Serious* and *Terrorist*.

So, there's no excuse... send those entries in now!

#### Virgin Games Rules OK!

- Entries to the Virgin Games Logo Compo must be post-dated no later than June 30, 1986.
- Each entry must include a copy of the completed coupon, as well as some number of Virgin Games logos clearly marked on the back of the envelope.
- The Editor's decision is final, no correspondence will be entered into regarding the rules.



#### VIRGIN GAMES LOGO COMPO

Scissors: rip off as many as you can... if you want a chance of getting your hands on all the Virgin Games goodies. Address all entries to Virgin Games Logo Compo, Your 64, 14 Rafflebone Place, London W1P 1DB. And don't forget to write the number of Virgin Games logos you find in the illustration on the back of the envelope!

I managed to find  
Send my prize to

Virgin Games logos in the illustration.















Name

Address

Postcode

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# Y64 TOP TEN CLASSICS

			<b>1</b> INTERNATIONAL FOOTBALL COMMODORE			
Scott Brown 4-7 (level 8)	Philip the Gardet 2-0 (level 8)	Alexis 2-0 (level 8)		Shaggy 840,700	Alexis 217,100	David Santos 210,600
			<b>3</b> BEACH HEAD US GOLD			
David Fleming 113,800	David Santos 438,200	Andrew Staff 194,400		Steve Mullhead 8,233	Steve Cox 1,400	Jon Hammond 3,287
			<b>5</b> RAID OVER MOSCOW US GOLD			
David Fleming 912,600	Alexis Torrell 281,900	David Santos 219,300		Alexis 7,864 1 Silver	Steve Mathews 7 Gold 1 Bronze	Joey Lewis 9 Gold 1 Silver
			<b>7</b> MANIC MINER SOFTWARE PROJECTS			
Mark Prescott 35,438	Julian Day 8,500	Steve Bakerwhite 8,300		Steve Mathews 4.40pm Staff destroyed	Steve Cox 8.40pm Staff destroyed	Samuel Price 7.01pm Staff destroyed
			<b>9</b> JET SET WILLY SOFTWARE PROJECTS			
Mark Prescott 48 pieces	Steve Mathews 24 pieces	Tony Wright 10 pieces		Mathews Judge 28,248	Alexis 107W	Mike Looman 8,000

## Y64 TOP TEN HOT SHOTS

<b>1</b>  BRUCE LEE US GOLD	<b>6</b>  RAID ON BUNGELING BAY ARIOLASOFT
<b>2</b>  BOULDER DASH STATESOFT	<b>7</b>  SEASIDE SPECIAL TASK SET
<b>3</b>  TAPPER US GOLD	<b>8</b>  AQUA RACER BUBBLE BUS SOFTWARE
<b>4</b>  POLE POSITION US GOLD	<b>9</b>  ARCHON ARIOLASOFT
<b>5</b>  BC'S QUEST FOR TIRES SOFTWARE PROJECTS	<b>10</b>  COMBAT LEADER US GOLD



# SCRATCHPAD

We welcome back programming Guru Jamie Clyde for another helping of the best software hints and tips around.

This here's the stopping-off place for all you programmers about to set out on a major project. What we've got here is a series of small routines that deal with a specific programming problem in the most efficient way. Each routine has been written to a set format — lines 20-50 call up the routine from the main part of the program, and lines 1000-on contain the routine itself.

Of course, if you've got a routine that you think would be suitable for your fellow H4 programmers, then send it in. Try and keep to the same style if you can, and it's worth bearing in mind that you'll not only become famous, but you'll be paid for your contribution — we pay well for published routines. But then we've got to be good!

The routines given here may not look very much at first glance, but you'll soon find that you start saving those bytes. And don't forget, keep those routines coming — send them to [Sourcebook@your.dial.up.com](mailto:Sourcebook@your.dial.up.com) (Place London W0P 1D).

## Typewriter Text

[illegible]

Remember the way the instructions for Adventure's Grouchoester game were typed up on screen? Well, here's a routine that'll do it all for you. All you have to do is place the text in the array `Ad` and it'll be printed up in a slow "typewriter" style; note that the speed of the printing is controlled with the variable `T1` in line 1818.

## Sounding Out The Keys

[illegible]

Some computers emit a sound each time you press a key—which can often be useful if you're developing an educational program. Type in this routine and you'll find that the 'G' key will beep when you press it; obviously, to make any other key make a noise, you'll have to alter PG accordingly in line 161.

### Printing Boxes

[illegible]

1. 已知  $x^2 + y^2 = 1$ ，求  $\frac{dy}{dx}$ 。  
 2. 已知  $y = \sin x$ ，求  $\frac{dy}{dx}$ 。  
 3. 已知  $y = \cos x$ ，求  $\frac{dy}{dx}$ 。  
 4. 已知  $y = \tan x$ ，求  $\frac{dy}{dx}$ 。  
 5. 已知  $y = \cot x$ ，求  $\frac{dy}{dx}$ 。  
 6. 已知  $y = \sec x$ ，求  $\frac{dy}{dx}$ 。  
 7. 已知  $y = \csc x$ ，求  $\frac{dy}{dx}$ 。  
 8. 已知  $y = e^x$ ，求  $\frac{dy}{dx}$ 。  
 9. 已知  $y = \ln x$ ，求  $\frac{dy}{dx}$ 。  
 10. 已知  $y = a^x$ ，求  $\frac{dy}{dx}$ 。  
 11. 已知  $y = \log_a x$ ，求  $\frac{dy}{dx}$ 。  
 12. 已知  $y = x^a$ ，求  $\frac{dy}{dx}$ 。  
 13. 已知  $y = \sqrt{x}$ ，求  $\frac{dy}{dx}$ 。  
 14. 已知  $y = \frac{1}{x}$ ，求  $\frac{dy}{dx}$ 。  
 15. 已知  $y = x^2 + 3x - 5$ ，求  $\frac{dy}{dx}$ 。  
 16. 已知  $y = x^3 - 2x^2 + x - 7$ ，求  $\frac{dy}{dx}$ 。  
 17. 已知  $y = 2x^2 + 3x - 1$ ，求  $\frac{dy}{dx}$ 。  
 18. 已知  $y = x^2 + 2x + 1$ ，求  $\frac{dy}{dx}$ 。  
 19. 已知  $y = x^2 - 3x + 2$ ，求  $\frac{dy}{dx}$ 。  
 20. 已知  $y = x^2 + 1$ ，求  $\frac{dy}{dx}$ 。  
 21. 已知  $y = x^2 - 1$ ，求  $\frac{dy}{dx}$ 。  
 22. 已知  $y = x^2 + x$ ，求  $\frac{dy}{dx}$ 。  
 23. 已知  $y = x^2 - x$ ，求  $\frac{dy}{dx}$ 。  
 24. 已知  $y = x^2 + 2x + 1$ ，求  $\frac{dy}{dx}$ 。  
 25. 已知  $y = x^2 - 2x + 1$ ，求  $\frac{dy}{dx}$ 。  
 26. 已知  $y = x^2 + 3x + 2$ ，求  $\frac{dy}{dx}$ 。  
 27. 已知  $y = x^2 - 3x - 2$ ，求  $\frac{dy}{dx}$ 。  
 28. 已知  $y = x^2 + 4x + 4$ ，求  $\frac{dy}{dx}$ 。  
 29. 已知  $y = x^2 - 4x + 4$ ，求  $\frac{dy}{dx}$ 。  
 30. 已知  $y = x^2 + 5x + 6$ ，求  $\frac{dy}{dx}$ 。  
 31. 已知  $y = x^2 - 5x - 6$ ，求  $\frac{dy}{dx}$ 。  
 32. 已知  $y = x^2 + 6x + 9$ ，求  $\frac{dy}{dx}$ 。  
 33. 已知  $y = x^2 - 6x + 9$ ，求  $\frac{dy}{dx}$ 。  
 34. 已知  $y = x^2 + 7x + 12$ ，求  $\frac{dy}{dx}$ 。  
 35. 已知  $y = x^2 - 7x - 12$ ，求  $\frac{dy}{dx}$ 。  
 36. 已知  $y = x^2 + 8x + 16$ ，求  $\frac{dy}{dx}$ 。  
 37. 已知  $y = x^2 - 8x + 16$ ，求  $\frac{dy}{dx}$ 。  
 38. 已知  $y = x^2 + 9x + 20$ ，求  $\frac{dy}{dx}$ 。  
 39. 已知  $y = x^2 - 9x - 20$ ，求  $\frac{dy}{dx}$ 。  
 40. 已知  $y = x^2 + 10x + 25$ ，求  $\frac{dy}{dx}$ 。  
 41. 已知  $y = x^2 - 10x + 25$ ，求  $\frac{dy}{dx}$ 。  
 42. 已知  $y = x^2 + 11x + 30$ ，求  $\frac{dy}{dx}$ 。  
 43. 已知  $y = x^2 - 11x - 30$ ，求  $\frac{dy}{dx}$ 。  
 44. 已知  $y = x^2 + 12x + 36$ ，求  $\frac{dy}{dx}$ 。  
 45. 已知  $y = x^2 - 12x + 36$ ，求  $\frac{dy}{dx}$ 。  
 46. 已知  $y = x^2 + 13x + 42$ ，求  $\frac{dy}{dx}$ 。  
 47. 已知  $y = x^2 - 13x - 42$ ，求  $\frac{dy}{dx}$ 。  
 48. 已知  $y = x^2 + 14x + 49$ ，求  $\frac{dy}{dx}$ 。  
 49. 已知  $y = x^2 - 14x + 49$ ，求  $\frac{dy}{dx}$ 。  
 50. 已知  $y = x^2 + 15x + 56$ ，求  $\frac{dy}{dx}$ 。  
 51. 已知  $y = x^2 - 15x - 56$ ，求  $\frac{dy}{dx}$ 。  
 52. 已知  $y = x^2 + 16x + 64$ ，求  $\frac{dy}{dx}$ 。  
 53. 已知  $y = x^2 - 16x + 64$ ，求  $\frac{dy}{dx}$ 。  
 54. 已知  $y = x^2 + 17x + 72$ ，求  $\frac{dy}{dx}$ 。  
 55. 已知  $y = x^2 - 17x - 72$ ，求  $\frac{dy}{dx}$ 。  
 56. 已知  $y = x^2 + 18x + 81$ ，求  $\frac{dy}{dx}$ 。  
 57. 已知  $y = x^2 - 18x + 81$ ，求  $\frac{dy}{dx}$ 。  
 58. 已知  $y = x^2 + 19x + 90$ ，求  $\frac{dy}{dx}$ 。  
 59. 已知  $y = x^2 - 19x - 90$ ，求  $\frac{dy}{dx}$ 。  
 60. 已知  $y = x^2 + 20x + 100$ ，求  $\frac{dy}{dx}$ 。  
 61. 已知  $y = x^2 - 20x + 100$ ，求  $\frac{dy}{dx}$ 。  
 62. 已知  $y = x^2 + 21x + 112$ ，求  $\frac{dy}{dx}$ 。  
 63. 已知  $y = x^2 - 21x - 112$ ，求  $\frac{dy}{dx}$ 。  
 64. 已知  $y = x^2 + 22x + 121$ ，求  $\frac{dy}{dx}$ 。  
 65. 已知  $y = x^2 - 22x + 121$ ，求  $\frac{dy}{dx}$ 。  
 66. 已知  $y = x^2 + 23x + 132$ ，求  $\frac{dy}{dx}$ 。  
 67. 已知  $y = x^2 - 23x - 132$ ，求  $\frac{dy}{dx}$ 。  
 68. 已知  $y = x^2 + 24x + 144$ ，求  $\frac{dy}{dx}$ 。  
 69. 已知  $y = x^2 - 24x + 144$ ，求  $\frac{dy}{dx}$ 。  
 70. 已知  $y = x^2 + 25x + 156$ ，求  $\frac{dy}{dx}$ 。  
 71. 已知  $y = x^2 - 25x - 156$ ，求  $\frac{dy}{dx}$ 。  
 72. 已知  $y = x^2 + 26x + 169$ ，求  $\frac{dy}{dx}$ 。  
 73. 已知  $y = x^2 - 26x + 169$ ，求  $\frac{dy}{dx}$ 。  
 74. 已知  $y = x^2 + 27x + 182$ ，求  $\frac{dy}{dx}$ 。  
 75. 已知  $y = x^2 - 27x - 182$ ，求  $\frac{dy}{dx}$ 。  
 76. 已知  $y = x^2 + 28x + 196$ ，求  $\frac{dy}{dx}$ 。  
 77. 已知  $y = x^2 - 28x + 196$ ，求  $\frac{dy}{dx}$ 。  
 78. 已知  $y = x^2 + 29x + 209$ ，求  $\frac{dy}{dx}$ 。  
 79. 已知  $y = x^2 - 29x - 209$ ，求  $\frac{dy}{dx}$ 。  
 80. 已知  $y = x^2 + 30x + 225$ ，求  $\frac{dy}{dx}$ 。  
 81. 已知  $y = x^2 - 30x + 225$ ，求  $\frac{dy}{dx}$ 。  
 82. 已知  $y = x^2 + 31x + 242$ ，求  $\frac{dy}{dx}$ 。  
 83. 已知  $y = x^2 - 31x - 242$ ，求  $\frac{dy}{dx}$ 。  
 84. 已知  $y = x^2 + 32x + 256$ ，求  $\frac{dy}{dx}$ 。  
 85. 已知  $y = x^2 - 32x + 256$ ，求  $\frac{dy}{dx}$ 。  
 86. 已知  $y = x^2 + 33x + 273$ ，求  $\frac{dy}{dx}$ 。  
 87. 已知  $y = x^2 - 33x - 273$ ，求  $\frac{dy}{dx}$ 。  
 88. 已知  $y = x^2 + 34x + 289$ ，求  $\frac{dy}{dx}$ 。  
 89. 已知  $y = x^2 - 34x + 289$ ，求  $\frac{dy}{dx}$ 。  
 90. 已知  $y = x^2 + 35x + 306$ ，求  $\frac{dy}{dx}$ 。  
 91. 已知  $y = x^2 - 35x - 306$ ，求  $\frac{dy}{dx}$ 。  
 92. 已知  $y = x^2 + 36x + 324$ ，求  $\frac{dy}{dx}$ 。  
 93. 已知  $y = x^2 - 36x + 324$ ，求  $\frac{dy}{dx}$ 。  
 94. 已知  $y = x^2 + 37x + 343$ ，求  $\frac{dy}{dx}$ 。  
 95. 已知  $y = x^2 - 37x - 343$ ，求  $\frac{dy}{dx}$ 。  
 96. 已知  $y = x^2 + 38x + 364$ ，求  $\frac{dy}{dx}$ 。  
 97. 已知  $y = x^2 - 38x + 364$ ，求  $\frac{dy}{dx}$ 。  
 98. 已知  $y = x^2 + 39x + 385$ ，求  $\frac{dy}{dx}$ 。  
 99. 已知  $y = x^2 - 39x -$

Defining boxes all over the screen can be a costly business as far as memory goes — but there's a shortcut that'll save you bytes. Simply enter the length and width of the box as variables `X` and `Y` in line 60, and then define the shape of the box as `XS`; the shapes you input to `XS` should be in the form of top-left corner, top-right corner, bottom-left corner, bottom-right corner and the sides.

### Data Type

[illegible]

● This routine allows you to type in data in blocks of eight, starting at line 1000 (see the variable in line 1005). Note that this routine should be deleted as soon as all the data has been entered.

### Flashing Text

[illegible]

● This is a useful display routine that I scroll any text entered into A4 sideways across the screen. The addition of the `!strchr` that, if you put a `PHS OM` character in the array, the next 10 lines will be fashion.

### Centering Printed Text

图例：内径为 $\phi 60$ 的管子，壁厚为 $t=8$ ，材料为HT150，其应力强度校核如下：

（1）计算当量应力： $\sigma_{eq} = \sqrt{\frac{1}{2}(\sigma_1^2 + \sigma_2^2)} = \sqrt{\frac{1}{2}(100^2 + 100^2)} = 70.7 \text{ MPa}$

（2）查表得许用应力： $[\sigma] = 90 \text{ MPa}$

（3）比较： $\sigma_{eq} < [\sigma]$ ，满足要求。

● This routine allows you to center any text that's entered into the array `AS` (see line 10) on the printed output. An obvious note, maybe, but it's worth remembering that you'll need a prime to make this routine work properly!

# tír na nóg

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WINNER - CRASH MAGAZINE'S  
BEST SHOOT-ON-UP GAME

Here you, sitting in the pits — how can you change your tires and, if needed, get back on the track again?



This mechanic is in charge of fixing the car. Change your tires and fuel. You can also change the engine, wheels and even swap the fire machine around for things like spray — only available once the fuel tank gets filled in capacity. If you're stuck in a pit, you can wait until it's full to get back on the track again.



Even while you're in the pits, enemies have tricks up. If you want to be able to get a moment's peace, watch out for the guardbots. Don't spend too long in the pits!

Once you've activated this mechanic, you can wait for your fire machine to get fixed. For a full repair and new maintenance, look out for the gas prices and how long it takes to get fixed. Changing the type is a nice reward at first, but you'll want to get the biggest fix.

To activate the fire mechanic, just press up to the gas pump, and the fixed fire driver, you can see. The player wheel says the type and what the fire machine can do. You can also see the fire machine's fuel and gas prices in the fire button again.

This mechanic has a lot of uses. It's not just for getting a full repair. It's also useful when you're in a pit. If you don't have a fire machine, it's a good idea to get one. It's a good idea to get one. It's a good idea to get one.

You'll find your own secret combinations in the next 100 seconds or so. The best way to learn this is to try it out. There's nothing wrong with that. Just try it out. There's nothing wrong with that. Just try it out.



Q: What's the best way to learn this? A: The best way to learn this is to try it out. There's nothing wrong with that. Just try it out. There's nothing wrong with that. Just try it out.



At a certain point, you can get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.



Wherever you are, you can get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.



There are also some things you can do to get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.

You can also get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.

There are also some things you can do to get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.



When you're in the pits, you can get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.

Between the activation and the activation, you can get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.



If you're in the pits, you can get an advantage over the computer's car in that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet, which means that you can wait along all 100 feet.





The figure indicates your speed. The 40 mph on this package's package top wheel, whereas with careful driving you should be able to hit 100 mph by the end of the track.

The figure indicates your speed. The 40 mph on this package's package top wheel, whereas with careful driving you should be able to hit 100 mph by the end of the track.

The white line is the center of the track. It's a warning signal, especially when you're taking corners. Other cars always avoid the center, so it's not too hard to stay in the center lane.

It's The Pit! The computer-driven (and human-driven) cars are always in the pits at the end of the track. The computer-driven cars are always in the pits at the end of the track. The computer-driven cars are always in the pits at the end of the track.



Overlooking the race track is a small, dark-colored car. The car is moving towards the right. The track is blue with white lines. The car is a small, dark-colored car.



Handsome. The car is moving towards the right. The track is blue with white lines. The car is a small, dark-colored car.



Handsome. The car is moving towards the right. The track is blue with white lines. The car is a small, dark-colored car.

# BURNIN' RUBBER...

Strap yourself in for a hair-raising race around some of the fastest Grand Prix tracks around the world. Facing Ianisid Roger Willis and Sue Denham drive themselves round the bend with the CBS/Asyn package Pistop II.

**C**ar-racing simulator games seem to be two entirely nowadays, but Pistop II is different. First of its predecessors, Pistop II will be pleased to hear that none of the titles are gone... indeed, they're doubled! The horizontally split screen presents a separate view of two cars on the grid, showing both but making one on each half-screen. A player can take on the computer or two budding Grand Prix stars can larger pistopists in a two-wheel-to-wheel struggle.

## Wheels Meet Again?

Basic driving skills must be developed to survive masterfully and zoom around the selection of well-known Grand Prix circuits... but the key to enjoyment, addition and even fanatical dedication is the competitive element, best exploited via human opposition. It is possible,

though, once you've had a bit of practice to follow the computer-driven opposition into the weeds.

Apart from getting, and staying, in front, complications arise through left-wheeling, stalling, and the resultant reversals of pistop. Judging when to use the pits and getting gold at the operations taking place there are a great deal of fun, except when you're battling against the 64 who seems to have a great deal of experience in this messy task. Even experts cannot resist swapping subterfuge virtually every lap when you're at Pistop level (the highest of three levels; beginners would be left-handed to stick to 'Rockie' level until they get the hang of things) because the game is engineered cleverly to make avoidance of aggression pretty near impossible. If your opponent isn't out to get you, you can be sure that the other cars will be.

Nothing's perfect, and Pistop II certainly has its limitations. It's no good driving the jolly old bangers with just any old joystick — a good one is vital! Also, it can become very frustrating if your opponent crashes off-circuit with a terminal blow (because there isn't anything left to do except cruise around and wave to the onlookers) — if there were any, that is. This premise, as entering to the automatic pistopists can be particularly annoying when it happens in the middle of a good or important. (Because it's just the rules of the game though.)

If you test yourself as a budding Mario Andretti clone, you could do a lot worse than shelling out £8.95 for the cassette version of Pistop II for £14.95 for the disk version (and getting your first few hundred hours of Grand Prix experience under your safety belt on the 64).

# If you're into program writing...

## Get this into an envelope

If the programs you are writing involve sophisticated graphics, you have two choices, a severe headache or Touchmaster.

Obviously you'll want to consider the latter, so in the mean time send away for your free Touchmaster literature and find out more about the best value/performance graphics tablet available.... or take two pain killers!



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Pen Talfan, West Glamorgan, SA11 1WY.

To: Touchmaster Limited, FREEPOST, Pen Talfan, West Glamorgan, SA11 1WY.  
Please send me free Touchmaster literature. C31 1-103

Name

Address

Make of  
computer

# PROTECT & SURVIVE

*Protecting your listings can often be more trouble than it's worth. But if you've got something to hide, keep it concealed... with a little bit of help from Max 'Big Brother' Phillips*

**A** bug that bites many a programmer is the strange desire to bury a listing under a veil of secrecy. While this is debatably a less important issue than stopping people from copying your programs, it's still a popular pastime and occasionally a very useful thing to be able to do.

It is, however, hard to do properly. Ask yourself — should you be protecting your *list* program or writing the next? A good reason for hiding a listing is to stop someone cracking a password system or cheating at your latest adventure game. You may even want to bury a hidden serial number in each copy of a program. Well, it's all possible...

## The Protection Racket

If you *still* want protection, it must be said now that you can never really protect a listing, especially this in Basic. It's a gambler's game: you try to put more effort into protecting the listing than someone seems to put into cracking it. Whenever it is here is taken a look at some simple 'tricks' you can use, but be warned that this is only a start-

ing point for you to develop your own system. Even if the codebreakers haven't tried these tricks before, they'll certainly know all about it once they've finished reading!

The golden rule to bear in mind is that any sensitive stuff in a Basic program should be encrypted so that even if someone got to have a good look at the listing they'd be none the wiser. Of course, the 'brute force' method of protection is to alter the program so that it won't list, and there are hundreds of possible techniques to consider...

Ask anyone about protecting listings and, with a token shrug, you'll get "Oh yeah, there's a single POKE that does it". Want a list? There is a POKE, but it's almost impossible to build it into a program so that the listing never becomes visible. Try it for yourself — load a sample program and then type:

```
POKE 774,0
```

LS/Teg it now will only give you the line numbers up, on-screen. Addresses 774 and 775 are collectively called 'the List vector', and hold the address of the part of

Commodore Basic that lists out lines. By changing that address, you can relocate the LIST command to anywhere in memory you like. Personally, I much prefer to POKE in the address of the 64's warm-start routine with the following command:

```
POKE 74,POKE(00)
POKE 75,POKE(00)
```

Unfortunately, there's no way that a program can execute these POKEs as it loads into memory. The only way to make this a sensible trick to back up is if the program auto-started everytime it was loaded — a could then disable LIST, Run/Stop and Restore, and no-one would ever stop and list it. But as you probably know, it's very hard to make a Basic program auto-start on the 64.

What we need is some way of tampering with the program itself so that it lists the LIST command. Key in the following short program so that we can experiment on it:

```
10 REM "TESTME"
20 FOR I=1 TO 10
30 PRINT I
40 NEXT I
50 PRINT "DONE"
```

Once done, have a look at the accompanying diagram that details exactly how the program is stored in memory. Each Basic line starts with two bytes that tell Basic where the next line starts; this is known as the 'link field' — it links the lines together. The next two bytes are the line number of that line, and then there's the line itself which is encoded in it's own sweet way. Each line ends with zero byte and the next one begins straight after. Finally a link field of two zeros signals the end of the program.

GO70, GOSUB and LIST all use the link field to find their way round the program, but PRINT doesn't. You can therefore hide lines by POKEing a link field with the

## MEMORY MATTERS

This chart is an explanation of how the two-line test program given in the listing is stored in memory. Points to note are the link bytes that make up the link field, the zero bytes at the end of each line (Z.O.L.), and the two-zero bytes that signify the end mark. Note by adding the POKEs — i.e. Ray Ponder — lines 20, 30 and 40 disappear.

Address	BYTES															
2048	0 (start mark)															
2049	18	0	18	0	180	32	43	43	0	0	0	0	0	0	0	0
	LINK		LINE 10		REM SPACE I - - - - -											
2050	30	0	30	0	180	32	71	71	0	0	0	0	0	0	0	0
	LINK		LINE 20		FOR SPACE I - - - - - SPACE 33 SPACE I - - - - -											
2051	40	0	40	0	180	32	73	0								
	LINK		LINE 30		PRINT SPACE I - - - - -											
2052	40	0	40	0	180	32	73	0								
	LINK		LINE 40		NEXT SPACE I - - - - -											
2053	50	0	50	0	180	32	74	0								
	LINK		LINE 50		PRINT SPACE I - - - - -											
2110	0 END MARK															



address of a line further down the program. Try:

```
POKE 2049,0
POKE 2050,0
```

This makes the first link field point to the last line of the program. Now type LIST and you'll find that lines 20,30 and 40 no longer appear: LIST follows the links and skips over them. What's happened here is that you've created a hidden patch of memory inside the Basic program; you could just as easily have some data POKE'd in it or even a small machine code routine. Now RUN the program and you'll find that although they don't exist on the on-screen LIST, they still exist!

Now for the catch. GOTO and GOSUB can't find hidden loops (they follow the links remember). Secondly, whenever you alter a program or even UNLOAD it, a part of Basic (possibly called the re-linker) loses all the links in the program. The hidden lines re-appear. Potted again!

## What's New?

We can, however, use this technique to help NEW a program. From first principles, when you enter NEW, Basic makes the first link field into two words to signal the end of the program and then alters locations 40 and 46 to hold the address of the first byte after this and mark. Addresses 40 and 46 are called VARTAB and hold the addresses where the current Basic program starts in memory.

However, if we leave VARTAB alone and just POKE two zeros into the first link field, we still have a program in memory but Basic isn't tied to it (this is called a semi-filled program). So, to protect the program enter:

```
POKE 2049,0:POKE 2050,0
```

You can still SAVE and LOAD as normal but, before you can use the program, you'll have to POKE addresses 2049 and 2050 back to their original values. It's therefore prudent to POKE them and make a note of their values before you make the program.

(Before we move on to greater things, there's one very popular trick that involves altering the line number field rather than the link fields in order to produce an indelible copyright message or otherwise interesting remark/statement. Add a message at the end of your program, such as:

```
### NEW RUNNY WOE WOE
```

Then, add these lines at the start of your program, run them and then delete them:

```
1=PEEK(40)-PEEK(46)/256-4
2:PRINT "< > © 1984-1987 D JIMMY"
3:PEEK(40)=256:PEEK(46)=256:END
```

These peek out Jimmy's line number and change it to 85530, which is an illegitimate number and therefore extremely difficult to delete!

## The Doctor is In!

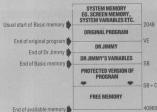
Enough of this tripe... and let's get down to a program that really does conceal things. It's called Dr Jimmy and,

```
100 VS=2049:IL=0:W=0:T=0
110 VE=PEEK(40)+PEEK(46)/256
120 SB=PEEK(50)+PEEK(56)/256+1
125 PRINT "SILENCE PLEASE..."
130 I=VS:C=0
140 FOR I=1 TO I+1:POKE SB+C,PEEK(13)+C:0
I=I+1:NEXT I
150 POKE SB+C,0
160 FOR C=1 TO C+3:POKE SB+C,INT(RND(1+256)/4)+1:NEXT C
170 IF PEEK(13)>C+9 THEN POKE SB+C,PEEK(13)+C:0:1:1+1:GOTO 170
180 IF I<VE THEN 140
190 H=INT((SB+C)/256):L=(SB+C)-256*H
200 PRINT CHR$(147):PRINT:PRINT
210 PRINT "POKE 45,";L;" " POKE 46,";H:PR
INT:PRINT
220 H=INT((SB+1)/256):L=(SB+1)-256*H
230 PRINT "POKE 43,";L;" " POKE 44,";H:PR
INT:PRINT
240 PRINT "POKE 55,0:POKE 56,160":PRINT:PR
INT:PRINT
245 PRINT "REM NOW SAVED IT!":PRINT:PR
INT:PRINT
250 PRINT CHR$(19)
270 FOR T=631 TO 634:POKE T,13:NEXT T:PO
KE 130,4
```

The program above, Dr Jimmy, will protect all your Basic listings. First off, load the original, the POKE 43, PEEK 45; POKE 44, PEEK 46; then load Dr Jimmy, then POKE 55, PEEK 56; POKE 55, PEEK 56=0, and save the protected version. Next, use 64 and load the protected listing.

## DR JIMMY'S MEMORY MAP

Here you'll see that the program is kept in two blocks in memory. Dr Jimmy is then loaded above it and it's — if it overwrites the original into memory, making changes as it goes, and then gives you the opportunity to SAVE the protected version. So start the 64, load in your new program and then you go... instant protection!



## ADDRESSING THE 64

Name	Address	Function
TEXTAB	45 and 46	Holds the address where the current Basic program starts.
EMPTAB	45 and 46	Holds the address where the current Basic program ends.
MEMSZ	64 and 66	Holds the address of the highest memory location available in Basic.
KEY	130	Contains the number of characters waiting in the keyboard buffer.
Keyboard buffer	421-640	Holds characters waiting to be processed.
Listvector	774 and 775	Holds the address of the LIST routine.
GETOP	888 and 889	Holds the address of the 64's "wait-input" routine.

We've made use of a number of useful addresses in the memory map to produce maximum secrecy. Here's a table of the most useful of them — read and digest.

although it looks bizarre, the program should delete all but lineatics from looking at your masterpiece. There's a vicious rumour going round that there are some 64 owners who don't read FOR, but these poor unfortunate are going to be more than sorry next time they try breaking into one of your listings. Indeed, even if you're using the program yourself you've got a tough job on your hands.

Dr Jimmy doesn't actually go to the trouble of encrypting a program — it just adds a few extras to each line that'll stop LIST printing anything but the line numbers up on-screen and flood the dedicated printer (but these extras don't prevent RUN and all the other commands from working properly. Of course, there are some overheads to this — every line grows by five bytes and the conversion process itself means that you can only protect programs up to about 16K in length. But it's still rather clever ... have a look at the program map to see just how clever!

To use Dr Jimmy, first type in and save its listing. Next, make sure that you've got an original copy of your final masterpiece; once protected, it's not easy to restore the listing! Now, enter:

```
POKE 56,POKE(45)
POKE 56,POKE(45)
```

This tells the 64 that Basic programs now start where the original ends so that you can LOAD Dr Jimmy without destroying your original. Now type:

LOAD "BUBBLE"

Next, we want to seal off free memory ready for the protected version of your program, so input:

```
POKE 55,POKE(45)
POKE 56,POKE(45)-4
```

The '-4' just leaves some space for Dr Jimmy's variables. Next, enter RUN and wait. Conversion is quite slow to be patient and, finally, you'll see the screen clear and a series of POKES automatically execute. These prepare the protected program for SAVING. Finally, SAVE the protected version with a new name. Don't even think of doing anything else before you SAVE it or else you'll spoil the whole spell!

You can now switch off your 64 (the easiest way of restoring its memory to normal) and load the protected listing. You can still add and delete lines from the listing so that at this point you could add a title and copyright message to the 'invisible' listing; you can even doctor a small section of the program by protecting it first and then adding all the 'public' lines afterwards.

## How It Works

Dr Jimmy works by exploiting a strange anomaly in Commodore Basic. After the line number and line fields, it writes a phoney end-of-line mark (a zero byte) — this means that after LIST has printed the

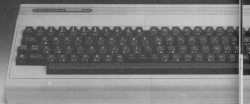
line number, it finds this and goes straight to the next line. Following the zero byte, line 176 POKES in four magic numbers that allow Basic to execute the rest of the line as normal; this phoney end mark also throws the re-linker off the scent so that it never makes the hidden lines re-appear!

After it's generated the protected version of the program, Dr Jimmy fills and automatically executes some POKES to make the protected version into an 'ordinary' Basic program so that you can SAVE it. The POKES are executed by printing direct commands on to the screen and then filling the keyboard buffer with four carriage returns. When the program stops, the 64 dutifully types the four carriage returns for you and you're ready to SAVE. I'm afraid there is no way you can put these POKES into a normal Basic program because they effectively make the program itself vanish as it's executing!

## In The Beginning ...

Obviously, this is just a starting point. You could alter the program to actually encrypt the Basic program, perhaps using a password; a hidden routine at the start of your program could then restore the encrypted program before continuing. But if you're serious about protection, you shouldn't discuss your final Master Operation with anyone. On the other hand, if you do come up with some interesting suggestions do let us know! You never know, we may be able to help ...

# The answer to your pro



## That's one answer, here's a more practical one - BREDEN'S BASIC

Much as we all love the Commodore 64 for playing games or running our business software on, when it comes down to the nitty-gritty of learning more about the computer and doing some programming, there is much room for improvement.

That's why we created **BREDEN'S BASIC** — it may not be the only extended basic around, but after reading the following information we are sure it is the only one you'll buy.

**BREDEN'S BASIC** — the Essential Extended Basic for the Commodore 64 incorporating High Resolution Colour Graphics, Streamlined Programming Techniques, Multi-Colour Graphics, User Defined Character Graphics, Music and Sound Synthesis and Toolkit Facilities plus many other useful features.

**BREDEN'S BASIC** has more commands, 136 in all, for the programmer to use than any other Extended Basic currently available, and drives the Sound and Graphic chips to their fullest extent short of writing in Machine Code.

# 64 PROGRAMMER OF THE YEAR

Commodore

Don't hide your bytes under a bushel. If you're a brilliant programmer awaiting discovery ... here is your chance! And you could be in the running for a Commodore 128. Let's be hearing from you!

Your 64 magazine and Commodore UK have teamed up and we're searching for a very special person — the 64 Programmer of the Year. And it could be you ...

So, if you've written a program for the Commodore 64 — be it an arcade game, adventure or utility — or this is the push you've been waiting for, then we want to hear from you.

## Byte High, No Limit

There's no no limits to the subject matter or the number of programs you submit — just make sure it's all your own work. All submissions will be assessed on the programming skills displayed and their ability to carry out the function for which they were written.

The only handicap you've got is that we're going to impose a 10K limit on the amount of code you use. We've upped the limit to give you a bigger byte of the action. At 128, of course, if you're into machine code, you've got an advantage ... but this isn't a test of who thinks best in binary. Each program will be judged for structure, use of sound, user-

friendliness, professional polish and, above all, original ideas.

The best six programs submitted will be published in Your 64, one per issue, starting in July 1985. The last possible date we can accept entries for the competition is October 31st, 1985 — but if you've already written a worthy program, send it off straight away or you'll miss out on the early judging.

## The Winners

The six published programs will go into the final judging to choose the overall winner of the competition. But the best program won't just win its

author the coveted accolade Your 64 Programmer of the Year, there's also a brand-spanking new Commodore 128 up for grabs!

Of course, all six programs published will earn their authors a substantial fee from the magazine ... and Commodore UK are slumping up a bonus prize of your choice of Commodore software up to the value of £50 for each author. Can't be beat!

So, if you want your name up with the greats from the programmer's book of Who's Who, send your programs to Programmer of the Year, Your 64, 14 Rathbone Place, London W1P 10G. Fame and fortune could come your way ... so get programming now!



# Programming problems?



- Each command fully explained with example and explanation.
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- SPRTED and U/D's may be SAVED or LOADED directly from tape or disc. The same is true of RE-EDIT GRAPHICS.
- Makes obsolete the need to calculate RAM addresses for any graphic commands.
- BREDEIN-BASIC comes with a 160pg. easy to use manual plus disc and cassette in a presentation box.
- Less than £6 BREDEIN-BASIC allows plenty of room for program development.

## BREDEIN'S BASIC OFFERS

Great value for money at £39.95, a higher degree of versatility and individual user friendliness. All in one easy to use package.

C.L.M. (Computer Software Marketing) Ltd.  
Sandy Road, 181/184 Chesham Hill Road, London NW10 5JZ. Telephone 01-881 1995

## Y64 MEGA GAME

# THE FINAL FRONTIER?

Welcome aboard the *Colossus Mk. II* for a spot of interplanetary trading. Your co-pilots are Teresa Maughan and Slave Broadcastist. Ready going where none have been before...

## STAGE 1



The planet's name, its location, and its attributes are listed in the Commodore 64 interface.

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**E**veryone's heard of *Star Wars* — it was a smash on the BBC Movie, making the number one spot in the charts for April. Well, it's now over a year later, and the Commodore 64's *Star Wars* is still going strong. It's the original and the best of its kind.

### Rough Trade

If you recall the classic games, *Star Wars*, you've got a pretty good idea of what *Star Wars* is about. You play the role of the *Colossus Mk. II*, a starship that can trade with the planets and the stars. It's a game of strategy and combat. You can trade with the planets and the stars, and you can fight the other ships. It's a game of strategy and combat.

You begin your mission with the *Colossus Mk. II*, a starship that can trade with the planets and the stars. It's a game of strategy and combat. You can trade with the planets and the stars, and you can fight the other ships. It's a game of strategy and combat.

and it means you can trade with the planets and the stars. It's a game of strategy and combat. You can trade with the planets and the stars, and you can fight the other ships. It's a game of strategy and combat.

Probably the easiest way to make some quick money is to trade in the marketplace and then trade in the marketplace. However, you'll soon find that if you do, you'll soon learn yourself the *Star Wars* game and that means you're not only trading but for the various goods and services. You'll find that the game is a lot of fun.

### Star Wars?

To trade successfully will almost certainly require you to be quite politically astute. The game is a lot of fun, but you've got to be quite politically astute. The game is a lot of fun, but you've got to be quite politically astute.

You'll soon be able to recognize the approach of enemy ships, and that's the key to success. The game is a lot of fun, but you've got to be quite politically astute. The game is a lot of fun, but you've got to be quite politically astute.

## STAGE 2



The planet's name, its location, and its attributes are listed in the Commodore 64 interface.

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[illegible]

**Lines 5800-6129** Ask the questions in the random sequence setup in `Rg`, displaying each of the four possible answers. It then checks your answer alongside the correct one, updates the score and moves on to the next question.

[illegible]

**Lines 5000-5100** This routine takes the string held in `PS` and prints it in a format that makes sure no words are split over the edge of the screen.

[illegible]

When 7800-7140 This is the 'save' routine, allowing you to save the questions to a file for future reference or for swapping questions with your mates.

```

PRINT "USER"
INPUT "ENTER FILENAME: " FNAME
OPEN FNAME FOR R+
FOR C=1 TO 25
  INPUT I, S(I) : REM QUESTIONS
  INPUT M1, M2C : REM MULTIPLE CHOICES
  INPUT C1, C2C : REM CORRECT ANSWERS
  INPUT D1, D2C : REM DIRECT ANSWERS
NEXT C
CLOSE
END

```

**Lines 7500-7600** The 'loop' routine allows you to load in a series of conditions and answers and calculate M-SSA-SSA.

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Our resident gamers, Steve Malone and Pete Connor, tackle all that's new in Commodore 64 games software.

How critical it seems to be finding articles or perhaps promotional activity, but it does seem that the quality of games software is improving. Is this a flimsy thought, or? The reason could be that it's finally deemed as software companies that they're not going to hog everything that's "burned out" these days — rather, older products need a modicum of effort and originality to back them up. However, of course, that's not always the case... which brings us to the "land of the real" — the games that don't quite make it to the larger markets. Hidden to your perils and here we go.

Take for example... *Wizard of Wor*. This game is produced by a not-independent software house you may have heard of — Commodore. Dressed in the same sort of packaging as international Football, the strategy may be considered that they're on the verge of buying something special. What you're really getting is an at-risk adaptation of a classic — with only three or four other conversions at any one time — which number around 200,000 and would then out of their misery. A shoddy game.

Also from Commodore, there's *Wizard of Wor*. Now here's a funny thing. This is touted



as a "new" release but the title page says "Copyright 1981". And what's more, it almost certainly isn't one of those "been there since the master games that probably had the parties" according to design when it first rolled off the production line but, as they say, the times they are a-changing.

Another number in Commodore's gold watch stable is *Don't*, a title that sounds like the someone laughing down the toilet! This isn't one-game, but several little ones stuck together, and the first is just a version of good old fashioned Space Invaders, the others are the sort of production line "shoot-em-ups" that

we've come to expect from the "cheapies". Compare to your MP.

Looking through the other half of the store on the overnight stall, there's *Rock 'n' Roll from Activision*. The idea here is that you're going to create a tower block, using bricks and planks, from the blueprint displayed on the bottom of the screen. If there's a blueprint displayed, you make it up as you go along (which explains a lot about the policy used to design the tower blocks in the UK). It seems like a pretty good game, until you consider the dumb graphics and/or graphics. Not bad, but not rivalling *Robotix*.

## SUPER WUZY UN-ON

By David H. H.

Since just recently there's been a deluge of realistic flight simulators. Both the Commodore and Atari offer to provide you, the customer, with all manner of knobs and controls to play with. However, most of these games involve high performance jet fighters... whereas this one is based on a helicopter.

The *Wuzy* was a helicopter that had achieved fame in the Vietnam war and, more recently, in such films as the *Young Heroes*. However, this is *Super Wuzy* — an experimental new version in other words. US Code programmers have taken the opportunity to add a few extra features that aren't on the original — but what the heck!

Like most of these games, there are four levels of play, which means that you can get the hang of the controls before you start doing anything serious... like starting a fight with a cowboy!

The game certainly appears to be realistic (but then again, who do I know?). For instance, instead of justifying off, you have to lay the rotor to the horizontal, engage the rotor and then take off. Once in the air, you can perform around the countryside — and quite pretty it is too, with rolling hills, trees and fields.

Despite the fact that it's just a game, it's getting a little better with flight instructors with extra tanks of controls. This is certainly one of the better games around. At least managed to bring it out of the ground!

**Pete** Don't be daunted by *Super Wuzy*'s lengthy instructions — this is the only flight simulator that's got one off the ground in less than two days!

Thanks to the *Wuzy*'s sophisticated on-board computer you're up and whirling in no time at all, swimming and climbing over a very attractive red terrain that's dotted with all

sorts of colorful trees and buildings. Despite having two different functions — cyclic and collective — on the cyclic, controls pretty straightforward. Must admit, though, that hovering is still beyond me.

Complete with the training program *Solo Flight*, *Super Wuzy* gives you the chance to go

into combat, rescue stranded folk in mountainous country and even try your hand at map-making. The graphics are excellent, as is the stirring noise of the engines and the boom of your machine guns. This is one flight simulator you won't wish to crash-land!

Although the view from the cockpit is not terribly detailed, there seems to be a fair amount of simulation going on.

The attitude and speed controls are given lots of a period of instruction so you'll realize that the *Wuzy* is handling itself all right.

The sounds of fuel and oil systems are given in these games. (Which you wouldn't do a lot of sightseeing you wouldn't have to make heads here.



The artificial horizon allows you to keep a good head while all around you are being thrown.

The engine and propeller rotation have to be slowed to the correct speeds otherwise you'll either fly or fire ground and look foolish or worse — stall.







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Rite Games/19.95



**Play** The old thing's song, *Band On the Run* plays constantly throughout the game. It's an appropriate choice, I mean if it does get on your

nerve pretty quickly it's because that's what this one's all about—a band on the run. As Paul McCartney (Heath, yeah, yeah!) is, you're to recover the lost track from the prison master (and of your initial list. And if you don't get it back, the real treasure itself will go the other way and you'll lose all rights to the record.

The trouble is, you can't remember the tune.... so, the only thing to do sure-construct the guy-sounding up all the other members of the group and making them re-do it all. You end up running around London trying to meet your old band as they emerge from various tube stations; you're provided with a tube and road map, and information about each band member. If you manage to complete the tune within the set time limit, you've managed to get back to the studio and mix it.

## BUCK ROGERS

20 Games/19.95



**Play** Buck's getting a bit long in the tooth these days—Bega brought him out way back in '82, if anyone remembers that far—you'll

find this latest foray still pretty good value if you're an aficionado of the '30 cap' era type game.

Essentially, you have to blast your way along the surface of a planet, clear out deep-sea ships, blast some space ships, blast an even bigger space ship and then go back to the planet where you can blast your way through the whole business all over again. Get the picture? (Unimpressed), but maybe please us to have their attractions.

The first stage is rather like a space platform, as you whizz through a number of gaps on the surface. After that, you go through them again but now trying to shoot whatever the oddity-shaped spaceships and malignant prog-locks.

In outer space, things are a bit more sedate



Screen display is very good, with pretty pictures of London landmarks wherever you go. Steering your car seems a bit easier with the keys rather than the joystick and, overall, the game is got a lot of obvious similarities to *Starblaster 2000*. Still, if you prefer strategy to action, and you're game for a challenging puzzle, then check it out.

**Score** Supposedly based on the film (which I haven't seen), you've gone back down the bits of the film from the various members of the band. And, as you know the band's history, you know how to find them. Now, as you might think, the odd bits of film, but (let's count) Beatles, Beatles partners and Beatles restaurants? For an unimpaired Beatles fan, only.



you'll be familiar with the action from a thousand other 3D 'shoot 'em-ups'. The graphics are OK, but they are beginning to show their age (although it must be said that the 3D effect is very convincing). Your ship responds well to joystick control and there's some frustration when it comes to aiming your lasers. Good, addictive on-screen violence.

**Score** From the usually stately Uff Gwahl, *Buck Rogers* looks remarkable like one of the Quack's outcrops that got leveled in this volume from time to time. Perhaps the years are finally running out of steam?

At the lowest level the game is terribly easy. The trouble is, the higher levels include the same scenario so that by the time the action gets interesting you're bored by the rest of it. Just a way of making a fast buck is that!

## CAULDRON

Palace Software/£7.99



**Score** This month's unrivaled contender for the 'Golden Coffer' award is *Cauldron*, and it's no easy matter to become queen of the witches.

The ingredients for the spell you're looking for don't just turn up on the disc itself, you've got to get on your broomstick and go look for them.

It's funny, but games of this sort always seem to be written either better than get average 3D 'shoot 'em-ups'. *Cauldron* involves great attention to detail in the graphics, often missing from the average *Cauldron* store; here, the games and background graphics are pretty constructed and makes the game a delight to look at.

Starting off in the witch's house, you happen to see your broomstick and it's up, up, up! Well! Naturally, discovering the sacred tools and pumpkins, pumpkins, pumpkins. Once you've got your magical power techniques, once you've been about a bit, you can always pop into one



of the cauldrons and here the action reminds you of *Jet Set Willy*.

An added bonus to this game is that the program has a series of tutorials, something that's sadly lacking in a lot of games. The way the instructions are written at the start, and the on-screen portrayal of the witch-hunting out of the sky when you run out of magic, should bring a smile to even the most jaded of games players.

**Play** The graphics are bewitching, with a clearly obvious 3D effect. As early as the '84, I thought I'd really enjoy it. But I don't. I just couldn't get the hang of flying and landing, no matter how hard or long I tried. I think this game needs one or two more spells to make it a cracker.



## WORLD SERIES BASEBALL

Imagine Software/£7.99



**Score** Imagine Software, the company that went bust all spectacularly last year has been patched up and thrown back into the fray, and

it's first offering is *World Series Baseball* or whatever as my old games master used to call it.

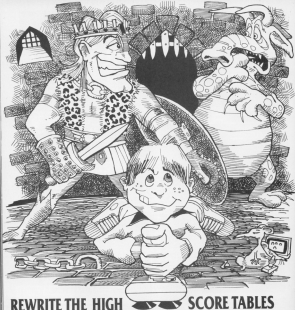
As you can imagine (see text), you control a baseball team and your task is to score more runs than the other side. After batting, you've got the choice of hitting the ball hard, slow or medium, and pressing the fire button at the right time gets you man controlling ball to bat. My first innings were perfect! But then I discovered that the big video-screen at the top wasn't there for decoration and it's that you've got to watch (and not the field) if you want a chance of hitting the ball. Once you've actually hit the ball it's easy—you maintain to first base automatically.

Likewise, when your team's leading, you've got the choice of height and speed of fly

throw. However, after a few throws I found some were not allowed... when I tried a fast low shot, the computer came up with the message 'BALL'. At first I thought this was a command on my playing, until I realised the computer was trying to tell me that you mustn't aim at the batter's corner plate!

After all, *World Series Baseball* isn't bad... in fact, it was much better than I expected. But it's hardly a *MegaGame* is it?

**Play** It takes some time to work out the rules of the game, despite its similarity to *Rounders*, because Imagine haven't provided all the necessary instructions. However, once you get the hang of it, it's quite good fun. The graphics are excellent, even if the figures do seem like a bit posh for strikers.



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## STARFIRE/FIRE ONE

ATI Systems, 350 Seventh, Ctr. 80, Box



**Blaze Man**, here's a new trend list — putting two or more games on a single tape. Accordingly, with the exception of the very

wonderful *Ball-Aid* cassette (the software houses aren't killing over themselves to bundle their best games together).

The first game is *Starfire*, a three-dimensional dogfight in space-outer. I've seen it before and you've seen it before, but this turned out to be one of the better versions. *Starfire* won't win any prizes for its graphics, but the strategies are smooth and believable and it's easily controlled.

I must admit that for the first few minutes I actually enjoyed getting through outer-space zapping enemy starships, but then I got that Two-Dice this before, sensation in the pit of my stomach and the feeling of pleasant seasickness replaced with boredom.

*Fire One* sounded like it was going to be a strategy game. Actually, it's more an

"arcade with a brain," along the lines of *Death Awaits*. Your mission is to sink an enemy fleet from a submarine below they sink yours. That's it — shoot anything that, and it won't help yourself sink your high-tech cruiser. I have to tell these games off as lightly, if they were solid singles, but together they make quite a nifty time package. You won't find the excitement of *Overloading the Heart*, but you could do a lot worse.

**Rate** Even though there are two games on one tape it still doesn't seem worth having. *Starfire* is a boring and outdated 3D "shoot-'em-up" with terrible blasting noises, while *Fire One* is a boring and archaic "war" game with terrible gurgling noises. I don't mind if this package ends up in space.



## JOUSTE

ATI Software, Ctr. 80



**Rate** Well, here's an idea that seems to have been around in computer games since at least the Middle Ages. The jousting knight, seated

on his trusty steed, fighting off evil-doers with his fearsome lance. So, what have we got here... a new *JoJo*?

*Joust* sports a very futuristic scenario — something you'll believe when you spot the terms knight riding a very large boar that flies around the screen taking on all sorts of creeps, including Laser Tanks and an invincible Phosphor!

Obviously, jousting of this nature requires the winner to be the knight whose lance is highest, this means there's a fair amount of button-pressing to keep the boar on a wings flap. Luckily, though, there are a number of platforms to rest on, that can also be used to shoot up or knock down on your unsuspecting boar.

As well as jousting, you've got to keep an

eye out for the eggs your adversaries drop — and crush them before they hatch more evil. A nice touch is the huge hand which sometimes reaches out of the water to grab your mount.

This ancient and venerable idea is unlikely to strike many gamers as very exciting, but if you fancy some nostalgia lance to lance combat, at least it's been programmed well.

**Blaze** I think I might be missing something on this one. I mean, I get the idea and everything, but I can't understand why everybody else's catch can fly and mine can't. Because of this, the game is weighted far too heavily in favor of the computer — a problem that can be leveled at a number of sophisticated on the market at the moment. It only goes to show there's no justice in the world of games.



## MULE

ATI Software, Ctr. 80, Cassette, Ctr. 80, Box



**Blaze** Another American-style which involves something called the MULE (which stands for Multi-User Labor Element) — the

all-purpose robot workhorse of the future. The scenario of the game is that you and three other volunteers have been dumped in a planet and left to get on with it.

So far, it all sounds like a typical sci-fi science fiction production, similar to *Planet of the Apes*, well, not exactly. What *MULE* actually does is re-locate the pioneering spirit as beloved of Ronald Reagan.

The trick of the game is that you and the other players get given plots of land and, in order to survive you've got to have sufficient quantities of "resources," among and food. If you run out of the market is one of those commodities, you can then make your fellow players pay through the nose for it. (In a fit of capitalist zeal at one point managers make one poor fighter pay four times the normal

maximum price for energy — and what's worse is that I feel good about it).

To get hold of the choice pieces of land, you've got to pass the previous player's *anybody*. This is virtually impossible when playing the computer at the higher levels but, luckily, the machine remains just a stupid as it is at lower levels when it comes to buying and selling.

Despite the mechanics work ethic propaganda behind the game it had me thoroughly hooked. Recommended.

**Rate** It wasn't at all bad being a *Planet of the Apes* and taking on the computer in a game that seems designed to manipulate the values of cheating, over-ambition, and so on. With two or more humans it could be very interesting.



## SPELUNKER

ATI Software, Ctr. 80, Cassette, Ctr. 80, Box



**Rate** *Atlantis* have made something of a name for themselves by bringing out a large number of very old American games.

*Spelunker* and exception, materializing from the almost forgotten era of 1980. The latter understood why software houses generate bringing out these relics from the past hoping they'll become popular.

*Spelunker* is a renaissance caverns and hopes game: Treasures of incredible wealth, and traps and barriers, restless ghosts of spelunkers who got their way... all await you if you take on the challenge.

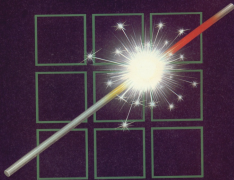
You descend in a convenient elevator and gather around the caverns, trying to collect treasures for your phantom's blood, dynamite for obstructions, keys, treasure... and so on. Frequently a cute ghost will wander along and turn you into a spell — if you're not quick with the joystick, that'll!

The game really looks its age, with blurry

graphics and little in the way of sound. It's by no means terrible — just one of those games it's very hard to find anything to criticize over. Seasoned gamers will surely find it too simple to keep them interested.

**Blaze** *Atlantis* and produced some of the better games that have appeared on the last few months. I want to thank by this one from thought to get the publisher of their previous efforts. For a graphics and sounds game (and that's all I really is), it wasn't nearly fast or awkward enough for my taste. The few figures that have appeared on such good effort in previous games are lost in *Spelunker*, and what's worse, no use is made of the split-screen positioning that is so much a part of the fun in these games.

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# ●PART 2●

## The Scribe

### THE DATABASE

In the last issue of *Your 64*, Dougie Barn detailed an interpreter program you can use to create an adventure game with a difference... and that difference is that you're in control! Join Dougie now in an adventure database that'll not only provide you with a scenario to baffle your friends, but also with a framework for you to follow when you write your first adventure program. It's quick and easy... bring nothing with you, apart from your trusty 64 and a healthy imagination. Welcome to The Scribe.



If it's been your secret ambition to write an adventure program then this is your lucky day! Together with the program in last month's issue (1984 issue 16), you are now holding the programming wherewithal to produce an adventure of your own making.

#### Do It Yourself!

The main problem with adventures is that they take so long to write... if you've got a month or two sometimes, why not have a go? But, of course, that's why we're here and, more specifically, why *The Scribe* was written. Using the interpreter program given last issue along with the database given here, you'll be able to tailor your way through a nine location scenario that takes you through a forest, by a fast-moving river, by snow-capped mountains, eventually leading you to an old, disused mine-working.

Well, if that doesn't sound so exciting, don't stop reading now... we've only just begun! We're not into the business of just giving you an adventure program — we're providing an unlimited number of adventures; all you need to do is to think of a scenario and it'll be a matter of a few minutes work to change the listing given here into something completely different.

And that's not the only thing. Once you've tracked a commercial program there's nothing to do except let the cassette gather dust on the shelf. With *The Scribe*, once someone's beaten one of your adventures all you have to do is alter a few variables, change a couple of PRINT statements and you've developed a whole new adventure!

#### Venturing Out...

Although the adventure scenarios given here may cause a few problems for experienced adventurers, none of it's secrets will be held back for *Your 64* readers. So that you'll be able to fully understand each section of the database, we've had to spoil the adventure somewhat by telling you exactly what happens. Further, once you've typed it all in and read through the explanations of each part of the program, you'll be set to re-write and add to the database as it stands.

It is a long listing to type in (unless you're lucky enough to be able to access it straight off Computer on the exclusive *Your 64* pages) but if you take it in stages, and read through the line-by-line analysis of each section, you shouldn't find it too much of a hassle. Once finished, and tagged on to the program given in the last issue (1984 issue 16) type RUN and play the game a few times making sure you understand how and why everything works as it does.

#### The Adventure Continues...

And if it's incentive you need, we've got it. There'll be a prize of ten software packages for the best adventure that's been written using *The Scribe*. All programs should be sent in by July 30th to 1984 Adventure Competition, Floor 64, 14 Rathbone Place, London W1P 1DE. We look forward to your entries flooding in...



## THE ADVENTURE DATABASE

Now you've typed in the adventure interpreter of *The Scribe*, let's move on to the database you'll need to play the game. Before we look at the game itself, though, here's a rough idea of what to expect over the next few lines of code.

- The adventure database is divided into seven sections:
- A list of responses/messages.
- The location descriptions and location numbers.
- The EVENTS table — the actions performed by the computer since you've given a command.
- The STATUS table — the actions performed by the computer if certain combinations of events turn out to be true.
- A table of connections between locations.
- A dictionary of words recognized in the game.
- The objects recognized in the game, their descriptions and starting locations.

Each of these sections will be explained in turn, but first we'll have to create an adventure with which to relate these to.

First off, it must be stated that this isn't going to be a complex adventure — there'll be up to you to sort out. There'll be no secrets here as to what will happen . . . everything will be set out so that you have no problems beating the game — after all, it's the technique you've got to sort out.

Have a look at the map of the adventure given and, once you've sorted out what goes where, have a look at the various tables in the database and see if you can make sense of them.

## MESSAGES AND RESPONSES

The messages and responses printed up on-screen during the adventure are stored between lines 3000-3151. The reason for each message may not be apparent from a quick squint through the print statements, but all will be clear once you've started playing!

To give you a rough example of how it all works, imagine that you're at location 3 (the Old Shack) and you've just typed in the command 'OPEN DOOR'. If you're carrying the keys, you'll get the message printed up from line 3005; if you've not yet collected the keys, you'll get the message from line 3010.

(These messages are printed up only if the program can find a match for your command with the ones specified in the EVENTS table).

The messages given in these lines are deliberately spaced, just in case you want to add a few descriptors to embellish the adventure given here.

```
3000 PRINT "THE DOOR IS OPEN." RETURN
3010 PRINT "THE DOOR IS LOCKED." RETURN
3020 PRINT "YOU ARE SLEPT AWAY AND DRIVEN
IN THE FAST-FLOWING RIVER." RETURN
3030 PRINT "THE ROAD BENEATH YOU CRUMBLES
A AWAY AND"
3040 PRINT "YOU PLUMBE DOWN A DEEP GORGE
TO A"
3050 PRINT "BLOODY DEATH ON THE JAGGED &
CRKS BELOW."
3060 RETURN
3070 PRINT "I'VE ALREADY LIT BOSS." RETURN
3080 PRINT "YOU'VE JUST BLOWN T'HEMP T'
BITE BOSS." RETURN
3090 PRINT "TH' DOOR'S LOCKED BOSS." RETURN
3100 PRINT "WELL DONE BOSS, Y'VE M&
ANAGED TO BURN"
3110 PRINT "DOWN THE DOOR." RETURN
3120 PRINT "YOU'D BETTER STOP BRATIN' M&
TOMES BOSS"
3130 PRINT "HE'S SORRY NEED THEM." RETURN
3140 PRINT "THAT'S A NICE FIRE BOSS, BUT
A RIN'T COL." RETURN
3150 PRINT "A'S SORRY BOSS, BUT A CAN'T
```

```
HELP Y'." RETURN
3160 PRINT "TH' DOOR'S OPEN BOSS." RETURN
3170 PRINT "Y' AIN'T GOT THE KEYS BOSS." RETURN
3180 PRINT "YOU'VE SLUT THE KEY ON THE LO
CK BOSS." RETURN
3190 PRINT "THE SIGN SAYS I - DANGER! ROA
D CLOSED." RETURN
3200 PRINT "HORDES OF HUNGRY WOLVES EMER
GE FROM THE DARKNESS AND TEAR YOU TO"
3210 PRINT "PIECES." RETURN
```

## LOCATION TEXTS

```
3220 PRINT "YOU ARE STANDING ON A GORT &
DND NEXT TO"
3230 PRINT "A FAST FLOWING RIVER, TO THE
EAST IS AN IMPASSABLE MOUNTAIN RANGE."
3240 PRINT "THE ROAD LEADS NORTH AND SOU
TH." RETURN
3250 PRINT "YOU ARE NEXT TO THE RIVER."
3260 RETURN
3270 PRINT "YOU ARE AT A JUNCTION ON THE
ROAD."
3280 PRINT "EXITS LEAD NORTH, SOUTH, EAST
AND WEST."
3290 RETURN
3300 PRINT "YOU ARE AT THE JUNCTION."
3310 RETURN
3320 PRINT "YOU ARE IN A CLEARING OUTSIDE
E AN OLD"
3330 PRINT "WOODEN SHACK. THE SHACK LOOK
S AS IF ITS"
3340 PRINT "BEEN ABANDONED FOR A WHILE."
3350 RETURN
3360 PRINT "YOU ARE OUTSIDE THE SHACK."
3370 RETURN
3380 PRINT "YOU ARE INSIDE THE SHACK."
3390 RETURN
3400 PRINT "YOU ARE IN AN OLD STONE GLEN
RY. THE"
3410 PRINT "ONLY EXIT APPEARS TO BE BACK
WEST."
3420 RETURN
3430 PRINT "YOU ARE IN THE GLASSY."
3440 RETURN
3450 PRINT "YOU ARE IN A DARK DENISE FORE
ST." RETURN
3460 PRINT "YOU ARE IN THE FOREST."
3470 RETURN
3480 PRINT "YOU ARE AT A FORK IN THE ROA
D. THE FORK"
3490 PRINT "TO THE WEST IS BLOCKED BY A
SIGN. THE"
3500 PRINT "OTHER FORK LEADS SOUTH."
3510 RETURN
3520 PRINT "YOU ARE AT THE FORK IN THE R
OAD."
3530 RETURN
3540 PRINT "YOU ARE OUTSIDE AND OLD WINE
WOOD INN."
3550 PRINT "THE ENTRANCE IS SEALED BY A
THICK"
3560 PRINT "WOODEN DOOR AND A HEAVY PAIR
LOCK."
3570 RETURN
3580 PRINT "YOU ARE OUTSIDE THE OLD WINE
WOOD INN."
```

# The Scribe

```
2501 RETURN
2502 PRINT "YOU ARE INVOLVING THE HOME LORDS.
END."
2503 PRINT "HOPEFULLY YOU SHOULD NOW HAVE
ENJOYED HQ!"
2504 PRINT "THE ADVENTURE INTERPRETER HAS
NOW END."
2505 PRINT "YOU SHOULD BE ABLE TO PRODUCE HQ
NOW."
2506 PRINT "OWN ADVENTURES."
2507 RETURN
2508 GOTO 2500
```

The descriptions of all the locations are given in lines 2503-2507. There's no particular reason for them to be located here and if you need room for more locations, then you can place the data anywhere you want. If you do move this section, remember to alter the line numbers given in line 2440 (for the descriptions) and line 2500 (for the test messages).

You'll find that there are two types of description given in the adventure — there's a full description for those who are visiting a particular location for the first time, and a smaller explanation if you're just passing through. For example, if you're visiting location 1 (the Old Quarry) for the first time, you'll get the full "YOU ARE IN AN OLD STONE QUARRY. THE ONLY EXIT APPEARS TO BE BACK TO THE WEST" message. However, if you've been there before, all you'll get is the slightly diminished response "YOU ARE AT THE QUARRY".

One last thing to note is that, although there are 10 locations in all, only nine are numbered. This is because the Deep Gorge doesn't count as a location, but only as an extension in the EVENTs table; check out the EVENTs table for more details.

## SETTING UP

```
10000 LET ACTH=44 10001 TOTAL NO. OF ENT
RIES IN THE EVENTs TABLE.
10002 LET STAT=5 10003 TOTAL NO. OF ENT
RIES IN THE STATUS TABLE.
10004 LET LNO=9 10005 TOTAL NO. OF LOC
ATIONS.
10006 LET LNOB=34 10007 TOTAL NO. OF MOR
PHS RECORDS.
10008 LET THOB=7 10009 TOTAL NO. OF OBJ
ECTS.
10010 LET LCL=1 10011 START LOCATION NO.
IN LCL 1-START LOCATION
```

Lines 10000-10009 fix the size of the arrays (tables) for the data in the rest of the database.

```
10020 DIM EVENTs(ACTH) 10021 PER EVENT TABLE
10022 DIM STATUS(STAT+1) 10023 PER STATUS TAB
LE
10024 DIM LOCATs(LNO) 10025 PER LOCATION C
ONTENTS TABLE.
10026 DIM VISITs(LNO) 10027 PER VISIT FLAG
10028 DIM DICTs(LNO) 10029 PER OBJECTS DICT
IONARY
10030 DIM OBJTs(THOB) 10031 PER OBJECT LOC
ATIONS
10032 DIM FLAGs(LNO) 10033 PER COUNTING PER FLA
GS AND COUNTERS
10034 DIM OBJL(10000) 10035 PER START LOC
ATIONS OF OBJECTS.
```

Lines 10020-10035 initialize the arrays for the data in the database.

These lines set up the size of each table in the database — so this is the area you'll be looking to alter when you come to writing your own adventures.

You may notice that there are two arrays that haven't been mentioned before — FLAGs and COUNTs. These are general purpose arrays, and you can assign them to whatever functions

you require in your program.

In the macro-adventure given here, only the first four FLAGs are used — and this is how they've been allocated:

- FLAG(1) This indicates whether or not the current location is dark — a zero of one means it's dark, zero indicates that a torch has been lit. (It's value is tested at line 2406 to see if the location is light; if it is then the description will be printed.)
- FLAG(2) This is more specific to the torch itself. A value of one indicates that the torch is on, a zero value means that it's not. (This is tested in line 2470, and the location description is only printed if the torch is on.)
- FLAG(3) This flag is used to indicate if the door at location 3 (the Old Shack) is open, a one means that it's been unlocked, a zero value shows it's still locked. (This is checked against the STATUS table in the subroutine at line 1306.)
- FLAG(4) Like FLAG(3), this indicates the status of the door to location 4 (the Old Mine Working) — a one means that it's open, a zero value shows it's still locked. (This is checked against the STATUS table in subroutine at line 1300.)
- The other array, COUNTs, is set up in the following way:
  - COUNT(1) This is reduced each time you enter a command (see line 2290). (This counter isn't used in the macro-adventure given here, but it could be used to print a message like "Hurry Up" if the adventure is taking a bit too long to make a move.)
  - COUNT(2) Have a look at line 2406 and you'll see that this array is reduced each time you move into a dark location.
  - COUNT(3) This array is reduced each time you're in a dark location with an unlit torch (see line 2470).

To illustrate how the COUNTs array works, let's consider COUNT(3). This array is set to three if you move North to the Dense Forest location (from the Junction location 2) and you're not carrying a lit torch. Then, each time you move around in the darkness of the forest without lighting your torch, COUNT(3) is reduced by one, until it reaches a value of one and is then checked against the fifth entry in the STATUS table — at this point, you'll be treated to an on-screen message informing you that you've been eaten by wolves or hungry wolves. The program then jumps to the end of the game.

## THE EVENT TABLE

```
10000 FOR N=1 TO ACTH
10001 READ DATA
10002 LET EVENTs(N)=DATA
10003 NEXT N
10004 DATA 4400000000000000,2400000000000000
10005 DATA 4400000000000000,2400000000000000
10006 DATA 4400000000000000,2400000000000000
10007 DATA 4400000000000000,2400000000000000
10008 DATA 4400000000000000,2400000000000000
10009 DATA 4400000000000000,2400000000000000
10010 DATA 4400000000000000,2400000000000000
10011 DATA 4400000000000000,2400000000000000
10012 DATA 4400000000000000,2400000000000000
10013 DATA 4400000000000000,2400000000000000
10014 DATA 4400000000000000,2400000000000000
10015 DATA 4400000000000000,2400000000000000
10016 DATA 4400000000000000,2400000000000000
10017 DATA 4400000000000000,2400000000000000
10018 DATA 4400000000000000,2400000000000000
10019 DATA 4400000000000000,2400000000000000
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10028 DATA 4400000000000000,2400000000000000
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10067 DATA 4400000000000000,2400000000000000
10068 DATA 4400000000000000,2400000000000000
10069 DATA 4400000000000000,2400000000000000
10070 DATA 4400000000000000,2400000000000000
10071 DATA 4400000000000000,2400000000000000
10072 DATA 4400000000000000,2400000000000000
10073 DATA 4400000000000000,2400000000000000
10074 DATA 4400000000000000,2400000000000000
10075 DATA 4400000000000000,2400000000000000
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10092 DATA 4400000000000000,2400000000000000
10093 DATA 4400000000000000,2400000000000000
10094 DATA 4400000000000000,2400000000000000
10095 DATA 4400000000000000,2400000000000000
10096 DATA 4400000000000000,2400000000000000
10097 DATA 4400000000000000,2400000000000000
10098 DATA 4400000000000000,2400000000000000
10099 DATA 4400000000000000,2400000000000000
10100 DATA 4400000000000000,2400000000000000
```



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```
10000 DATA 100000+RND*
10010 DATA 100000+RND*
10020 DATA 100000+RND*
10030 DATA 100000+RND*
10040 DATA 100000+RND*
```

The STATUS table is a table of conditions that's checked by the program each time it goes around the main program loop. Similar to the EVENTS table in many ways, the STATUS table doesn't have keycodes at the beginning of each of its entries. If the conditions in any of the entries are fulfilled, the program performs those actions and then heads back through the rest of the table until it comes to the last entry "0", which is the action command to get a new input.

To better understand the STATUS table, let's have a look at its first entry:

```
101000 1010
```

Looking through the conditions, we have "100" which asks whether we've gone to location 3 yet, and "not" to check if FLAG3 is on (or in English . . . is the door open?). If both conditions are fulfilled, the actions that follow are carried out: in this case, "ACT" would mean that the first message (see line 3005) is printed and "0" waits for a new input.

## THE STATUS TABLE

Entry	Conditions	Actions	Entry	Conditions	Actions
1	100 1010	ACT 0	4	100 1010	ACT 0
2	100 1010	ACT 0	5	100 1010	ACT 0
3	100 1010	ACT 0	6	"	0

## THE LOCATION CONNECTION TABLE

```
10410 FOR NW=1 TO LEND
10420 READ DATA
10430 LET LOCAT(NW)=DATA
10440 NEXT N
10450 DATA 10000000000, 1000100000000000
```

```
10000 DATA 1000000, 1000000, 1000000
10010 DATA 1000000000000, 10001000000
10020 DATA 1000000, 00
```

Lines 10010-10020 generate the connections between the locations you listed in the main adventure given here. Each connection consists of four characters: the first two of which are the direction code (which are obtained from DCTWHS — the Dictionary table) and the second pair from the location number of the destination.

Again, to provide you with an example of how this table works, let's look at the entry for location 1:

```
0101 0101 00
```

Looking at the figures in the order they're given, "0101" means that if you want to go North you'll go to location 2, "0001" means a trip South will put you in location 7, and "01" signifies that there are no other options.

One other thing to note is that there is no entry for the Deep Gorge — this is because it's dealt with in the EVENTS table. Also, you'll notice that the entry for location 6 always sends you back to location 6 — this is the equivalent to getting lost (finding your way out of location 6 requires a touch to be it which is taken care of in the EVENTS table).

## THE LOCATION CONNECTION TABLE

Location	Connection	Location	Connection
1	0101 0101 00	4	01 01 0100 0100 00
2	0001 0100 0100 00	7	01 01 0100 00
3	0000 00	8	01 01 00
4	0000 00	9	00
5	0000 00		

## THE DICTIONARY TABLE

```
10410 FOR NW=1 TO LEND
10420 READ DATA
10430 LET DCTWHS(NW)=DATA
```

## CREATING YOUR OWN ADVENTURE — A STEP-BY-STEP GUIDE

Well, you're on your own now. OK, I know the adventure given here isn't much of a brain-bender . . . but that's no reason why your own should live up to the high standards of many of the commercial adventures around nowadays!

Using the step-by-step guide below, you should be able to write your own adventures efficiently so that, if you don't stray too far from the example program given here, you are guaranteed to work. Obviously, you'll have to provide the imagination, and that can often be the most difficult part. The best thing to do is remember what you liked most about the plots of commercial adventure programs you've played before and try and use the same tricks. It's also worth recalling the frustrating times as well . . . and make sure your program doesn't put anyone off with shallow descriptions of the locations and the like. Adventures, above all else, should be fun.

The most important thing, however, is to enjoy yourself writing the adventure and to make sure it's fun to play! (See it in mind . . .)

**1.** Draw a map of your proposed adventure, marking in the location numbers and the connections between each location. Don't worry too much about your artistic skills — this is for your

guidance only as you build up the scenario. Try a small adventure first off if you feel a bit nervous!

**2.** Make a list of the descriptions for each location and enter these into the program at lines 3040, 3050, 3060 and so on. Remember to put a RETURN statement after each description.

**3.** Make a list of secondary descriptions for each location and enter these into the program at lines 3070, 3080, 3090 and so on. Remember to put a RETURN statement after each description.

**4.** Make a list of the connections at each location, and then convert it into the entries for the Location Connection table — LOCATs — and enter them into data statements in the program at lines 10010-10020.

**5.** Decide what objects you're going to need in your adventure, make a list of them and their start locations, and place them into the program at lines 10010-10020.

**6.** Decide on the messages/responses you'll need and enter these into the program at lines 3000 onwards. Note that you'll have to put a RETURN statement at the end of each message/response.

**7.** Make up the dictionary of words you'll need and assign the codes to each word

(remembering to give the same code to words of a similar meaning). When you've sorted these out, enter them into the program in the same format as you'll find at lines 10410-10480. Another thing to remember is that all the objects in the adventure must be placed here.

**8.** Decide what you're going to use the flags and counters for (see the section on Setting Up).

**9.** Make a list of the actions for the EVENTS table. (If you test for the same combinations of words more than once, make sure you put the entries in the correct sequence!) Once you've sorted out all the actions, code them up and enter the relevant figures into the program at lines 10040-10060.

**10.** Make up the entries for the STATUS table, code them and enter the relevant figures in the program at lines 10010-10020.

**11.** Test your adventure for errors — the best way to do this is to play the adventure as if you hadn't come across it before! If you find that most of your errors will more than likely be in the EVENTS and STATUS tables, so check these first for any mistakes you might have made when you coded the data.

**12.** Find someone to infect your adventure with!





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# The Scribe

```

10440 NEXT N
10450 DATA #INERT,AIN,OPUNT,BBS,EBERT,
    OOL,BABOT,BAL,BOLP,BOL,BOLUP,BBS
10460 DATA 13TAK,13BOT,13BOT,14BROP,14
    LOPY,15LON,15BOP,15LOON,15TOD,15BOT
10470 DATA 15BOP,15BOP,15LOON,15BOP,15
    BOP,15BOP,15BOP
10480 DATA 15BOP,15BOP,15BOP,15BOP,15
    BOP,15BOP

```

The Dictionary table (DICTAB) is held in the database between lines 10410-10480, and contains a list of the words recognised in the adventure. Each entry consists of six characters, comprising of a two character keyboard and the first four letters of the word to be recognised: this allows you to specify more than one word for an action of the same meaning — for example, 'TAKE' and 'GET' both have code 13.

As you can see from the Dictionary table given for this micro-adventure, the first 12 words are reserved for directions — this helps speed up the response time of moving around: it's always easier to type 'N' than it is 'NORTH'.

## THE DICTIONARY TABLE

00001(a)	000	00000	00000
000	00000	00000	00001(a)
00001(a)	000	00000	00001(a)
000	00000	00000	00001(a)
00001	000	00000	00001
000	00001	00000	00000
00001	00000	00000	00000
000	00000	00000	00000
000	00000	00000	00000
000	00000	00000	00000
000	00000	00000	00000
000	00000	00000	00000
000	00000	00000	00000

```

10510 FOR N=1 TO 10000
10520 READ DATA
10530 LET OBJECT=N+DATA
10540 READ OBJECT
10550 LET OBJECT=OBJECT
10560 LET OBJECT=N+OBJECT
10570 NEXT N
10580 DATA "A TORCH",0,"A LIT TORCH",0,"
    A BOX OF MATCHES",0,"A BOX OF KEYS",0
10590 DATA "A BUNCH OF COAL",0,"A BOX OF
    DYNAMITE",0,"SOME DRY WOOD",0
10600 RETURN

```

The descriptions of the objects you'll find in this micro-adventure are listed in lines 10510-10600, together with their starting location; this data is held, respectively, in arrays OBJECTS() and OBJL. Note that there's another array (OBJL) that contains a copy of the start location of each object.

Before we leave this table, make sure that when you're writing your own adventure you always place the same data object you've hidden around the locations in the Dictionary table — otherwise, the player won't be able to pick them up!

## THE OBJECT TABLE

Start location	Object description
1	The torch.
2	A lit torch.
4	A box of matches.
5	A bunch of keys.
6	A sack of coal.
8	A box of dynamite.
9	Some dry wood.

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# THE LAST BYTE!

## THE COMPUTER WAS MACHINE CODE TUTOR

### Part 7 Interrupts

- The register commands.
- Interrupts.
- Random number.
- Writing your own program.
- Homework solution.

Finishing up our machine code series, Andrew Bennett explores the finer points of rotation on-screen, interrupts and random numbers. And if you're thinking of writing your own programs, Andrew's got some useful advice for you...

Keeping in with last month's theme of bit manipulation — in which we took a look at the ASL and LSR commands that "shift" the bits of any particular byte left or right respectively, putting the bit at the end of the shift into the carry flag — we'll be detailing two more useful commands. The commands in question are ROL (Rotate Left) and ROR (Rotate Right), and they take the form ROL, \$0000 or ROL, \$001, and ROR \$0000 or ROR \$001.

Once executed, the target byte (\$0000) is shifted bit-by-bit in the direction of rotation. The carry flag is placed in the first bit and the last bit is placed into the carry flag.

Both rotation commands are simple enhance-

ments of LSR and ASL, and therefore their use is limited... but do watch out for instances when they can be used instead of ASL, or LSR.

### Scary To Interrupt!

Every 50th of a second, any program that's running on the 64 (be it in machine code or Basic) is interrupted and control is transferred to a special program at location \$E431. This program (known as the 'interrupt' program) takes care of all the internal workings of the 64, such as the clock, the cursor flash and keyboard.

Once the 'interrupt' program has done its job, all control is transferred back to whatever program was in progress; the interrupted program doesn't know there's been a break because the 'interrupt' program makes sure everything is exactly as it was before the interrupt. Once the main program has been interrupted it continues for another 50th of a second until it is then interrupted again; interrupts occur the whole time the 64 is turned on, even when there's no user program actually running!

Well it's nice to know how the 64 operates... but how does that help you make use of the interrupts? Luckily, when an interrupt occurs the 64 doesn't just jump to location \$E431, it looks at a special pointer (at location \$0014 and \$0015 in b-h format) and then jumps to the program at that pointer. We can make use of this pointer to direct flow to a program of our own; as this program is executed every 50th of a second, it could be used to play music, flash a portion of the screen or move the arrow on a line — anything you like really!

So far so good, but there's more! If we simply replace the 64's 'interrupt' program with our own, the 64 falls over after a very short while; this is because the 64's housework isn't being carried out. To solve this problem, though, is simple — just JMP to location \$E431 at the end of your own interrupt program and the 64 will take care of the rest!

### Back To The Drawing Board

If you study the procedure above, it might work... but don't hold your breath! Imagine the following: You place the 16 byte of the rest of your interrupt program (take the 16-byte location \$0014 program at \$C000) into location \$0014. When the first 50th of a second comes up, the 64 interrupts you trying to place the 16 byte (\$00) into location \$0015. The 64 then gives control to its interrupt program and so the 64 merely crashes!

What we need is a method of either timing precisely the replacing of the pointer with our own, or a method of stopping the possibility of interrupts for a while. And before the debate starts, the second method is by far the easiest and there's a couple of machine-code commands to achieve this anyway.

First up there's a SED (\$ED=disable interrupt), which stops the interrupts and allows safe replacement of the pointer. Secondly you can make use of CLU (\$CLU=enable interrupt), which restores the interrupts after you've replaced the pointer with your own.

Just as you don't hurt the magazine across the scene in frustration, there's an example of an interrupt program given here, that'll flash the top-line of the screen. Type it all in and execute it (with SYS48192). You should find that the top line will

## HOMWORK SOLUTION

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100 4 1 00000 10000 00000000
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